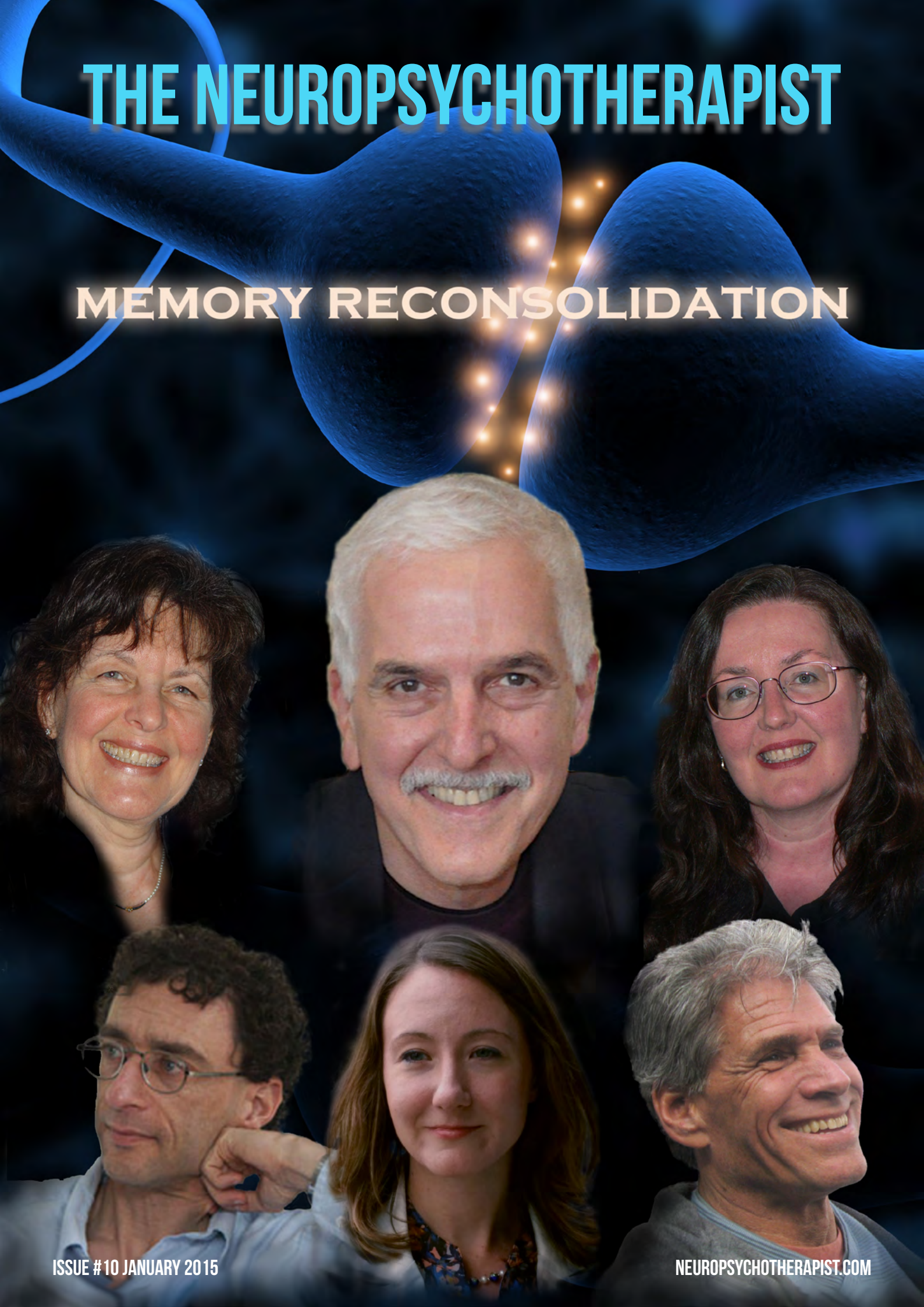
THE NEUROPSYCHOTHERAPIST

MEMORY RECONSOLIDATION



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From the Editor

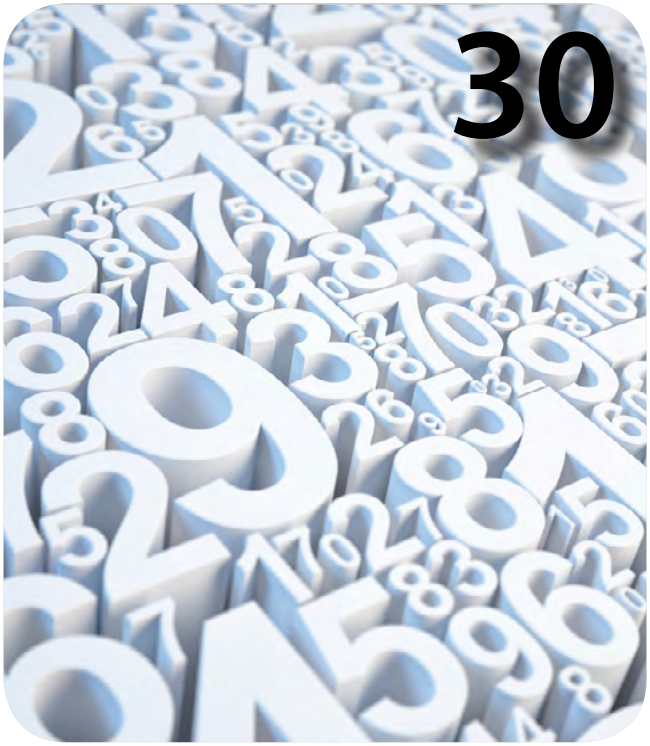
Matthew Dahlitz
Editor in Chief

How often can we say therapy has been a categorical success? Welcome to our special issue on memory reconsolidation (MR)—a foundational process with the potential, if properly understood, to consistently bring about the kind of transformational change that we look for in the lives of clients. Graciously coediting this issue is Bruce Ecker, one of the foremost experts in applying techniques that fulfil the neurobiological requirements to achieve MR in clinical practice.

In fact all of the authors in this issue are experts in their respective fields, demonstrating the unifying nature of MR in such diverse therapies as the Alexander technique, energy psychology, neuro-linguistic programming, and progressive counting. Understanding the biological basis of our memory and how it can be modified is the key to effective therapeutic change, especially when emotional memories are driving unwanted symptoms.

In publishing this issue I would like to acknowledge Bruce Ecker for his decades of study, observation, and subsequent articulation of what is behind our clients' pathology—or rather, their adaptive schemata that are no longer so adaptive—and what we, as therapists, can do about it in a definitive way. Bruce's coherence therapy, co-developed with Laurel Hulley, is a game changer for therapists and clients everywhere, and I hope this issue will inspire you to discover more about the power of memory reconsolidation for your clients.

Matthew Dahlitz



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CONTENTS

Issue #10 January 2015

FEATURES

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Cover Image: Matthew Dahlitz

Understanding Memory Reconsolidation

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This article is excerpted and adapted from
"Memory Reconsolidation Understood and Misunderstood" by Bruce Ecker in the
International Journal of Neuropsychotherapy, vol. 3, 2015.

EXTENSIVE RESEARCH BY NEUROSCIENTISTS since the late 1990s has found that the brain is innately equipped with a potent process, known as memory reconsolidation, that can fundamentally modify or erase a targeted, specific learning, even complex human emotional learnings formed subcortically, outside of awareness (Pine, Mendelsohn, & Dudai, 2014; for reviews see, e.g, Agren, 2014; Reichelt & Lee, 2013). Such learnings are found to underlie and drive most of the problems and symptoms addressed in psychotherapy and counseling (Toomey & Ecker, 2007; Ecker & Toomey, 2008), so the relevance and value of memory reconsolidation for the clinical field are profound.

To describe a particular learning as "erased" means that its behavioral, emotional, cognitive, and somatic manifestations disappear completely, and no further effort of any kind is required to maintain this nullification permanently. Such lasting, transformational change is the therapeutic ideal. There is growing evidence that in erasure, the neural encoding of the target learning is nullified (Clem & Huganir, 2010; Debiec, Díaz-Mataix, Bush, Doyère, & LeDoux, 2010; Díaz-Mataix, Debiec, LeDoux, & Doyère, 2011; Jarome et al., 2012). The discovery of an erasure process was something of an upheaval, reversing a firmly established conclusion, based on nearly a century of research, that subcortical emotional learnings were indelible for the lifetime of the

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individual (LeDoux, Romanski, & Xagoraris, 1989; Milner, Squire, & Kandel, 1998).

I began studying reconsolidation research findings in 2005, at about the 20-year point of my psychotherapy practice. Neuroscientists' densely technical accounts of their studies have been comprehensible to me, for the most part, thanks to my first career of 14 years as a research physicist, and it quickly became apparent to me that knowledge of reconsolidation could drive the evolution of the field of psychotherapy in major ways. The process that brings about erasure is so fundamental for potent, effective psychotherapy, and so sweeping in the advances that it delivers to the clinical field, that I refocused my clinical career on translating reconsolidation research into clinical practice. This has produced a versatile, integrative methodology of psychotherapy and a conceptual framework that maps out how knowledge of reconsolidation creates four major advances for the clinical field (Ecker, 2011; Ecker, Ticic, & Hulley, 2012, 2013a,b). These advances are: a new level of effectiveness for individual clinicians, the deep unification of seemingly diverse methods and systems of psychotherapy, clarification of the much-debated role of attachment in the therapeutic process, and a decisive breakthrough beyond nonspecific common factors theory and the almost 80-year-long "dodo bird verdict" that has appeared to limit all therapy systems to the same modest level of efficacy.

Understanding memory reconsolidation involves learning some new ways of thinking that differ from familiar concepts of psychotherapeutic change and may even seem counterintuitive initially. Therefore, various aspects of the reconsolidation framework are susceptible to misconceptions. I have been observing misconceptions as they have developed for nearly a decade as of this writing, and they are increasing as awareness of the importance of reconsolidation builds at an accelerating pace. In fact, sizable conceptual errors are being propagated widely in articles by science journalists in the popular media, in articles by psychologists in peer-reviewed journals, in posts by psychotherapists in online clinical discussion groups, and, surprisingly, even in articles and talks by some neuroscientists involved in reconsolidation research (Ecker, 2014).

Thus there is a growing need for a clear map of the new territory, showing where the path of understanding branches off into the various misunderstandings of memory reconsolidation.

Such a guide is very soon to be published (Ecker, in press), examining 10 widespread misconceptions. Three of those 10 are discussed in the current article, which is excerpted and adapted from the longer one. The three misconceptions addressed here are these:

- **Misconception:** The reconsolidation process is triggered by the reactivation of a target learning or memory.
- **Misconception:** Anxiety, phobias and PTSD are the symptoms that memory reconsolidation could help to dispel in psychotherapy, but more research must be done before it is clear how reconsolidation can be utilized clinically.
- **Misconception:** What is erased in therapy is the negative emotion that became associated with certain event memories, and

this negative emotion is erased by inducing positive emotional responses to replace it.

For readers not yet familiar with memory reconsolidation, next is a short overview as the context for discussion of the misconceptions..

Memory Reconsolidation in Context

Memory reconsolidation is the brain's innate process for fundamentally revising an existing learning and the acquired behavioral responses and/or state of mind maintained by that learning. In the reconsolidation process, a target learning is first rendered revisable at the level of its neural encoding, and then revision of its encoding is brought about either through new learning or chemical agents (for reviews see Agren, 2014; Reichelt & Lee, 2013). Through suitably designed new learning, the target learning's manifestation can be strengthened, weakened, altered in its details, or completely nullified and canceled (erased). Erasure through new learning during the reconsolidation process is the true unlearning of the target learning. When erasure through new learning is carried out in psychotherapy, the client experiences a profound release from the grip of a distressing acquired response (Ecker et al., 2012). The use of chemical agents to produce erasure is described later in this article.

In order to see the full significance of memory reconsolidation for psychotherapy, it is necessary to recognize the extensive role of learning and memory in shaping each person's unique patterns of behavior, emotion, thoughts, and somatic experience. Among the many types of learning and the many types of memory, the type responsible for the great majority of the problems and symptoms that bring people to psychotherapy is implicit emotional learning—especially the implicit learning of vulnerabilities and sufferings that are urgent to avoid, and how to avoid them. These learnings form usually with no awareness of learning anything, and they form in the presence of strong emotion, which greatly enhances their power and durability (McGaugh, 1989; McGaugh & Roozendaal, 2002; Roozendaal, McEwen, & Chattarji, 2009).

For example, if a small child consistently receives frightening anger from a parent in response to the child expressing needs, the child learns not to express or even feel needs or distress and not to expect understanding or comfort from others. This learning can occur with no representation in conscious thoughts or conceptualization, entirely in the implicit learning system. The child configures him- or herself according to this adaptive learning in order to minimize suffering in that family environment. Later in life, however, this same learned pattern has life-shaping, extremely costly personal consequences. The learnings in this example are very well-defined, yet they form and operate with no conscious awareness of the learned pattern or its self-protective, coherent emotional purpose and necessity. From outside of awareness these learnings shape the child's and later the adult's behavior, so the individual is completely unaware of living according to these specific learnings. The neural circuits encoding these learnings are mainly in subcortical regions of implicit memory that store implicit, tacit, emotionally urgent, procedural knowledge, not mainly in neocortical regions of explicit memory that store conscious, episodic, autobiographical, declarative knowledge (Schore, 2003).

The vast majority of the unwanted moods, emotions, behaviors, and thoughts that people seek to change in psychotherapy are found to arise from implicit emotional learnings, not in awareness

As in the example above, the vast majority of the unwanted moods, emotions, behaviors, and thoughts that people seek to change in psychotherapy are found to arise from implicit emotional learnings, not in awareness (Toomey & Ecker, 2007). Of course, some psychological and behavioral symptoms are not caused by emotional learnings—for example, hypothyroidism-

induced depression, autism, and biochemical addiction—but it is implicit emotional learnings that therapists and their clients are working to overcome in most cases.

It is the tenacity of implicit emotional learnings, more than their ubiquity, that is the real clinical challenge. On a daily basis, psychotherapists encounter the extreme durability of original emotional learnings that fully maintain their chokehold decades after they first formed. Researchers too have observed that "A unique feature of preferences [the authors use that term to denote compelling, emotionally complex avoidances and attractions] is that they remain relatively stable over one's lifetime. This resilience has also been observed experimentally, where . . . acquired preferences appear to be resistant to extinction training protocols" (Pine et al., 2014, p. 1). The life-constraining grip of such patterns is the bane of psychotherapists and their clients, yet that very tenacity is a survival-positive result of natural selection. In the course of evolution, selection pressures crafted the brain so that any learning accompanied by strong emotion becomes encoded by enhanced, exceptionally durable synapses due to the emotion-related hormones that influence synapse formation (McGaugh, 1989; McGaugh & Roozendaal, 2002; Roozendaal et al., 2009).

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So durable are implicit emotional learnings that they continue to function and drive responses even during states of amnesia and are only temporarily suppressed, not erased, by the process of extinction (non-reinforcement of a reactivated, learned expectation). Psychologists and neuroscientists have amassed extensive evidence that even after complete extinction of an emotionally learned response, the extinguished response is easily retriggered in various ways. This revealed that extinction training does not result in the unlearning, elimination, or erasure of the suppressed, original learning (making the term "extinction" something of a misnomer, suggesting as it does a permanent disappearance). Rather, the research found that extinction training forms a separate, second learning that competes against, but does not change, the original learning (see, e.g., Bouton, 2004; Foa & McNally, 1996; Milner et al., 1998; Myers & Davis, 2002).

Many decades of studying extinction led researchers to the conclusion that implicit emotional learnings are permanent and indelible for the lifetime of the individual once they have been installed in long-term memory circuits through the process of *consolidation* (reviewed in McGaugh, 2000). There appeared to exist no form of neuroplasticity capable of unlocking the synapses of consolidated implicit memory circuits. The tenet of indelibility reached its peak influence with the publication of a research article on extinction studies by neuroscientists LeDoux, Romanski, and Xagoraris (1989) titled "Indelibility of Subcortical Emotional Memories." The indelibility model soon entered the literature of psychotherapy when van der Kolk (1994) published in the *Harvard*

Year	Authors	Species	Memory type	Design and findings
2004	Pedreira et al.	Crab	Contextual fear memory	Reactivated learned expectation of visual threat must be sharply disconfirmed for memory to be disrupted by cycloheximide.
2005	Frenkel et al.	Crab	Contextual fear memory	New experience modifies memory expression only if preceded by a memory mismatch experience.
2005	Galluccio	Human	Operant conditioning	Memory is erased only by being reactivated along with a novel contingency.
2005	Rodriguez-Ortiz et al.	Rat	Taste recognition memory	Novel taste following reactivation allows memory disruption by anisomycin.
2006	Morris et al.	Rat	Spatial memory of escape from danger	Reactivation allows disruption of original memory by anisomycin only if learned safe position has been changed, creating mismatch of expectation.
2006	Rossato et al.	Rat	Spatial memory of escape from danger	Reactivation allows disruption of original memory by anisomycin only if learned safe position has been changed, creating mismatch of expectation.
2007	Forcato et al.	Human	Declarative memory	Memory of syllable pairings learned visually is destabilized and impaired by new learning only if, after reactivation by presentation of context, presentation of a syllable to be paired does not occur as expected, creating mismatch.
2007	Rossato et al.	Rat	Object recognition memory	Memory is disrupted by anisomycin only if reactivated in presence of novel object.
2008	Rodriguez-Ortiz et al.	Rat	Spatial memory of escape from danger	Reactivation allows disruption of original memory by anisomycin only if learned safe position has been changed, creating mismatch of expectation.
2009	Forcato et al.	Human	Declarative memory	Memory of syllable pairings learned visually is labilized and lost only if reactivation is followed by learning revised novel pairings.
2009	Pérez-Cuesta & Maldonado	Crab	Contextual fear memory	Reactivated learned expectation of visual threat must be sharply disconfirmed for memory to be disrupted by cycloheximide.
2009	Winters et al.	Rat	Object recognition memory	Memory is disrupted by MK-801 only if reactivated in presence of novel contextual features.
2010	Forcato et al.	Human	Declarative memory	Memory of syllable pairings learned visually destabilizes and incorporates new information only if, after reactivation, the expected opportunity to match syllables does not occur, creating mismatch.
2011	Coccoz et al.	Human	Declarative memory	Memory of syllable pairings learned visually destabilizes, allowing a mild stressor to strengthen memory, only if, after reactivation, the expected opportunity to match syllables does not occur, creating mismatch.
2012	Caffaro et al.	Crab	Contextual fear memory	New experience modifies memory expression only if preceded by a memory mismatch experience.
2012	Sevenster et al.	Human	Associative fear memory (classical conditioning)	Reactivated fear memory is erased by propranolol only if prediction error is also experienced.
2013	Balderas et al.	Rat	Object recognition memory	Only if memory updating is required does reactivation trigger memory destabilization and reconsolidation, allowing memory disruption by anisomycin.
2013	Barreiro et al.	Crab	Contextual fear memory	Only if memory reactivation is followed by unexpected, mismatching experience is the memory eliminated by glutamate antagonist.
2013	Díaz-Mataix et al.	Rat	Associative fear memory (classical conditioning)	Reactivated fear memory is erased by anisomycin only if prediction error is also experienced.
2013	Reichelt et al.	Rat	Goal-tracking memory	Target memory reactivated with prediction error was destabilized and then disrupted by MK-801, but not if brain's prediction error signal was blocked.
2013	Sevenster et al.	Human	Associative fear memory (classical conditioning)	Reactivated fear memory is destabilized, allowing disruption by propranolol, only if prediction-error-driven relearning is also experienced.
2014	Exton-McGuinness et al.	Rat	Instrumental memory (operant conditioning)	Memory for lever pressing for sucrose pellet was disrupted by MK-801 only if the reinforcement schedule during reactivation was changed from fixed to variable ratio, creating prediction error.
2014	Sevenster et al.	Human	Associative fear memory (classical conditioning)	Reactivated fear memory is destabilized, allowing disruption by propranolol, only if prediction-error-driven relearning is also experienced, and termination of prediction error terminates destabilzation.

Table 1. *Studies demonstrating that both memory reactivation and memory mismatch (prediction error) are necessary for inducing memory destabilization (deconsolidation) and reconsolidation, and that memory reactivation alone is insufficient.*

Review of Psychiatry his seminal article "The Body Keeps the Score: Memory and the Evolving Psychobiology of Posttraumatic Stress," in which there was a section titled "Emotional memories are forever." The conclusion that implicit emotional learnings persist for a lifetime meant that people could never become fundamentally free of flare-ups of childhood emotional conditioning. The worst experiences in an individual's past could at any time become reactivated and seize his or her state of mind or behavior in the present.

Then, several studies published from 1997 to 2000 suddenly overturned the model of irreversible memory consolidation and indelibility. Neuroscientists in several different laboratories resumed studying the effects of reactivating an established emotional learning (Nader, Schafe, & LeDoux, 2000; Przybyslawski, Roullet, & Sara, 1999; Przybyslawski & Sara, 1997; Roullet & Sara, 1998; Sara, 2000; Sekiguchi, Yamada, & Suzuki, 1997). Using sophisticated new techniques as well as the field's advanced knowledge of exactly where in the brain certain emotional learnings form and are stored in memory, researchers again demonstrated the full elimination of any expression of a target learning. In addition, they demonstrated that such erasure of the learning became possible because consolidated, locked memory synapses had returned to a deconsolidated, unlocked, unstable or "labile" state, allowing erasure of the learning by chemical agents that disrupt only synapses that are in an unstable, nonconsolidated condition. The longstanding tenet of irreversible consolidation was disconfirmed.

The destabilized state of deconsolidation was found to exist only soon after the target learning had been reactivated by a suitable cue or reminder. Yet, long after such a reactivation, an implicit learning is found to be once again in a stable, consolidated state. Thus the detection of a deconsolidated, destabilized state of memory soon after its reactivation implied the existence of a natural process of *reconsolidation*, the relocking of the synapses of a destabilized memory, returning the memory to stability. Subsequent studies found that the labile state of deconsolidation lasts for about five hours—a period widely known now as the reconsolidation window—during which the unstable target learning can be modified or erased (Duvarci & Nader, 2004; Pedreira, Pérez-Cuesta, & Maldonado, 2002; Pedreira & Maldonado, 2003; Walker, Brakefield, Hobson, & Stickgold, 2003). When a learned, unwanted emotional reaction is erased, there is no loss of memory of events in one's life (as shown by Kindt, Soeter, & Vervliet, 2009, and as illustrated by a clinical example later in this article).

With that background, we can now examine the misconceptions of the reconsolidation process listed above.

Misconception: The Reconsolidation Process Is Triggered by the Reactivation of a Target Learning or Memory

As noted earlier, in the reconsolidation discovery studies of 1997 to 2000, a state of deconsolidation was found to exist only soon after the target learning had been reactivated by a suitable cue or reminder. This observation was interpreted by the researchers to mean that each reactivation of a target learning deconsolidates its neural circuits, launching the reconsolidation process.

That conclusion may have been sensible based on the initial few studies, but it turned out to be incorrect. Pedreira, Pérez-Cuesta, and Maldonado (2004) were first to show that reactivation alone does not bring about deconsolidation and reconsolidation. They concluded, "at odds with the usual view, retrieval per se is unable to induce labilization of the old memory" (p. 581), and they demonstrated that what the brain requires to trigger the reconsolidation process is reactivation plus another critical experience, described below. Subsequently, this same two-step requirement has been demonstrated in at least 22 other studies that I have tallied as of this writing. They are listed in Table 1. In the discovery studies of 1997 to 2000, researchers had fulfilled this two-step requirement without awareness of doing so, as shown later in this section.

The early interpretation that reactivation by itself produces deconsolidation spread widely among both neuroscientists and sci-

ence journalists and became a reconsolidation meme. Despite the post-2004 piling up of decisive evidence revealing that this original conclusion was incorrect, it has continued to be asserted in new writings by not only science journalists but also by some prominent researchers who were involved in the original studies, as well as by many later reconsolidation researchers.

What, then, is the second step that must accompany reactivation? Pedreira et al. (2004), followed by all of the studies listed in Table 1, have shown that in order to induce reconsolidation, reactivation must be accompanied or followed soon by what researchers term a *mismatch* experience or *prediction error* experience. This is an experience of something distinctly discrepant with what the reactivated target memory "knows" or expects—a surprising new learning consisting of anything from a superfluous but salient novelty element to a direct contradiction of what is known according to the target learning. It makes sense from an evolutionary perspective that deconsolidation and reconsolidation, being the brain's process for updating learnings and memories, would be triggered only by new information that is at odds with the contents of an existing learning (Lee, 2009). Lee wrote, "reconsolidation is triggered by a violation of expectation based upon prior learning, whether such a violation is qualitative (the outcome not occurring at all) or quantitative (the magnitude of the outcome not being fully predicted)" The studies listed in Table 1 have shown that the brain evolved so as to launch de/reconsolidation *only when an experience of something discrepant with a reactivated, learned expectation or model of reality signals the need for an update of that existing knowledge*. This empirical finding of a critical role of mismatch or prediction error can be regarded as a neurobiological validation of a central feature of the learning models of both Piaget (1955) and Rescorla and Wagner (1972).

As stated by Agren (2014) in reviewing research on reconsolidation of emotional learnings in humans, "it would appear that prediction error is vital for a reactivation of memory to trigger a reconsolidation process" (p. 73). Likewise, Delorenzi et al. (2014) commented, "strong evidence supports the view that reconsolidation depends on detecting mismatches between actual and expected experiences" (p. 309). Exton-McGuinness, Lee and Reichelt (2015) review the role of prediction errors in memory reconsolidation studies and sum up their position by stating, "We propose that a prediction error signal…is necessary for destabilisation and subsequent reconsolidation of a memory." That is the research finding that translates into major advances for the psychotherapy field (Ecker, 2011; Ecker et al., 2012, 2013a,b).

"it would appear that prediction error is vital for a reactivation of memory to trigger a reconsolidation process"

For those advances to materialize, it is necessary for clinicians to understand well what the brain regards as an experience of mismatch or prediction error. Misconceptions abound on this point as well. The following example shows the meaning of mismatch at the basic level of classical conditioning in the laboratory, as demonstrated by Pedreira et al. (2004) and other studies listed in Table 1. Clinically relevant learnings are often far more complex, and the guiding of mismatch experiences in psychotherapy looks very different, as a rule, from the laboratory instances described in this article, but the principles of mismatch are usefully clarified at this basic level.

The study by Nader, Schafe and LeDoux (2000), which repeated the basic design of some other early studies (Przybyslawski et al., 1997, 1999; Roullet et al., 1998), is often regarded as the one that brought the initial research to a tipping point of establishing the reconsolidation phenomenon conclusively. The mismatch requirement was discovered four years later by Pedreira et al.

(2004), so Nader et al. were unaware of its presence in their procedure. They used a classical conditioning procedure in which rats learned to expect an electric footshock during the last half-second of a 30-second audible tone. One day later, their procedure accomplished memory reactivation with the *onset* of the 30-second tone, and it accomplished memory mismatch with the *offset* of the tone with no shock occurring. That mismatch of what the reactivated target learning expected quickly triggered destabilization of the target learning and launched the reconsolidation process. Erasure of the learned fear of the tone then was accomplished by promptly following the mismatch with administration of anisomycin, which destroys non-consolidated synapses but has no effect on stable, consolidated ones. If administered six hours later, after reconsolidation (restabilization) had occurred and the reconsolidation window was no longer open, anisomycin had no effect and the fear learning persisted.

Understanding the mismatch requirement allows us to interpret correctly the results of various studies that were misinterpreted by the researchers because they analyzed their studies without reference to the mismatch requirement. The simple logic of the situation, as stated by Agren (2014), is that "the studies that have shown effects of reconsolidation . . . must somehow have induced a prediction error" (p. 80). Ecker et al. (2012) articulated the same principle: "Whenever the markers of erasure of a learning are observed, both reactivation and a mismatch of that learning must have taken place, unlocking its synapses, or erasure could not have resulted. This logic can serve as a useful guide for identifying the critical steps of process in both the experiments of researchers and the sessions of psychotherapists" (p. 23).

For example, failure to achieve destabilization of a reactivated target learning has been reported in many studies (e.g., Bos, Becker, & Kindt, 2014; Cammarota, Bevilaqua, Medina, & Izquierdo, 2004; Hernandez & Kelley, 2004; Mileusnic, Lancashire, & Rose, 2005; Wood et al., 2015), and we can now recognize that this failure was due to an absence of mismatch or prediction error in the procedure used. (For example, , as reported by Hernandez and Kelley in 2004, a rat's memory that pressing a certain lever brings a sugar reward was indeed reactivated when the rat was once again placed in the chamber with the lever, pressed it and received a sugar pellet but this reactivation provided the expected reinforcement and entailed no experience of prediction error, so memory destabilization did not occur.)

All 23 studies listed in Table 1 have shown that reactivation alone does not launch the reconsolidation process, but reactivation plus mismatch does. This point was particularly emphasized by Forcato, Argibay, Pedreira, and Maldonado (2009) in titling their article, "Human Reconsolidation Does Not Always Occur When a Memory Is Retrieved," and by Sevenster, Beckers, and Kindt (2012), who titled theirs "Retrieval Per Se Is Not Sufficient to Trigger Reconsolidation of Human Fear Memory."

Reconsolidation can also be triggered by a mismatch of *when* events are expected to occur, with no change in *what* occurs, as demonstrated by Díaz-Mataix, Ruiz Martinez, Schafe, LeDoux, and Doyère (2013). On Day 1 in their study, rats heard a 60-s tone and received a momentary electrical shock at the 30-s point, midway through the tone. For each rat this was repeated 10 times to create a reliable conditioned response of fear to the tone. On Day 2, each rat heard the tone and received the shock again just once, reactivating the learned association of tone and shock. The shock occurred at the same 30-s point for some rats, but for others it occurred at the 10-s point. Immediately after this reactivation experience, researchers

Whenever the markers of erasure of a learning are observed, both reactivation and a mismatch of that learning must have taken place, unlocking its synapses, or erasure could not have resulted.

administered a chemical agent (anisomycin) that disrupts nonconsolidated memory circuits. On Day 3, the tone was played again for each of the rats five times with no accompanying shock, and the strength of fear responses was measured. Rats that had unchanged shock timing on Day 2 reacted with fear on Day 3 fully as strongly as they had done on Day 2, indicating that anisomycin had no effect and, therefore, that the reactivation without mismatch on Day 2 had not destabilized the target learning. In contrast, rats whose shock timing had been changed on Day 2 reacted on Day 3 with only half as many fear responses as on Day 2, indicating that anisomycin had significantly impaired the target learning and, therefore, that the reactivation with timing mismatch on Day 2 had indeed destabilized the target learning.

A target learning that has been destabilized by mismatch can be erased not only by chemical agents, but also by a counter-learning experience with no use of chemical agents. It is this endogenous approach that is most desirable for psychotherapeutic use and which has been applied extensively in that context (Ecker et al., 2012). In laboratory studies, endogenous erasure or modification of a target learning has been demonstrated with both animal and human subjects (e.g., Galluccio, 2005; Liu et al., 2014; Monfils, Cowansage, Klann, & LeDoux, 2009; Schiller et al. 2010; Steinfurth et al., 2014; Walker et al., 2003; Xue et al., 2012).

The experimental procedures discussed in this section in relation to the mismatch requirement illustrate a principle that is critical for understanding reconsolidation phenomena: *What does, or does not, constitute a mismatch experience depends entirely on the specific makeup of the target learning at the time of mismatch*. That is a principle that I will refer to henceforth as *mismatch relativity*. It is essential for understanding the effects of reconsolidation procedures used in both laboratory studies and therapy sessions. In the small minority of reconsolidation research articles that do address the mismatch requirement, I have never seen mismatch relativity articulated explicitly. Mindfulness of mismatch relativity is critical for consistent outcomes in utilizing reconsolidation in psychotherapy to bring about transformational change. Only by attending closely to the specific elements of a symptom-generating emotional learning can a psychotherapist reliably guide mismatch experiences that disconfirm those specific elements, as is necessary for their nullification and dissolution.

A question often asked by clinicians learning about reconsolidation is: When my panicky therapy client drives on the highway and the feared terrible fiery crash doesn't happen, that seems to be a mismatch experience, as needed to launch reconsolidation, yet it doesn't unlock or erase the learned fear. Doesn't this show that the model is incorrect? To clarify this, we need to apply the mismatch relativity principle and examine whether or not a mismatch experience actually took place. That begins with examining the detailed makeup of the target learning in question. In this case, the target learning is not that a car crash happens on every drive; rather it is that a crash *might* happen unpredictably on *any* drive. That learning is not mismatched or disconfirmed by an accident not happening on any one drive or on any number of drives. A safe, uneventful drive creates no prediction error and therefore does not induce deconsolidation, so the target learning is not revised and the model has not failed to apply.

This example naturally raises the question: For that target learning, what *would* be a mismatch experience? The knowledge that a crash might happen unpredictably on any drive is true as a recognition of existential reality, so no

mismatch or disconfirmation of that knowledge is possible. However, that knowledge is not the entire learning maintaining the panicky dread of a fiery car crash. Some other learning is responsible for that emotional intensity, and it is for elements of that learning that mismatches *can* be created. The most common form of this other learning, though not the only possibility (see Ecker, 2003, or Ecker & Hulley, 2000, for an account of diverse learnings underlying anxiety and panic symptoms), is suppressed traumatic memory of the same or a similar kind, such as a car crash, a fiery explosion, the death of high school classmates in a head-on collision, a terrible scare from skidding on ice on a mountain road or from being pulled along very fast at 3 years old in a little wagon tied to the bicycle of an older sibling, and so forth. The suppressed state of the traumatic memory preserves its emotionally raw, unprocessed quality, including desperate fear and helplessness. De-suppression of the memory (in small enough steps to be tolerable) reveals a set of specific elements, each of which is a particular learning. It is these component learnings that can now be subjected to a mismatch experience. For example, the helplessness felt and learned in the original situation can in many cases encounter a mismatch experience through the technique of empowered reenactment, which is widely used in trauma therapy to create a vivid experience of potent self-protection in the original scene. For a detailed clinical example of that kind, see Ecker et al. (2012, pp. 86–91).

In summary of this section, the research findings on memory reconsolidation represent a nontheoretical set of instructions for bringing about transformational change in a target learning. These instructions specify that in order for a target learning to become destabilized and susceptible to being unlearned and nullified, it must be both reactivated and subjected to a mismatch or prediction error experience. The mismatch relativity principle has been introduced here, within the exercise of analyzing the occurrence of mismatch in published studies, to emphasize that what is, and what is not, a mismatch experience is always defined in relation to the specific elements of the target learning and what the target learning "knows" or expects. This needed exercise of examining the role of mismatch in published studies will continue in each of the next two sections. (For numerous examples of creating mismatch experiences in psychotherapy, see Ecker et al., 2012, Chapters 3 to 6.)

Misconception: Anxiety, Phobias, and PTSD Are the Symptoms That Memory Reconsolidation Could Help to Dispel in Psychotherapy, but More Research Must Be Done Before It Is Clear How Reconsolidation Can Be Utilized Clinically

This section really comprises a blend of two misconceptions. First is the view that for clinical use, reconsolidation could be suitable for helping to dispel learned *fears* of various kinds, with symptomology such as PTSD, phobias, panic attacks and anxiety. This impression probably stems from the consistent tendency of researchers to comment in their research articles that reconsolidation has significant potential for treatment of PTSD and anxiety disorders. Researchers have to be ultraconservative in what they write so that everything they propose is firmly based on what is known according to the current state of research Reconsolidation is relevant as a candidate treatment only for conditions that are maintained by memory, and for a brain researcher there is no risk that PTSD could be unrelated to memory and therefore no risk of a departure from the required empiricism. Furthermore, fear is the most reliably detectable and measurable type of negative emotional response, so that researchers preferentially envision applications of the reconsolidation process to fear symptomology. Clinicians, however, regularly observe

phenomenology showing that an extremely wide range of other conditions also are rooted in and driven by implicit memory (Ecker et al., 2012; Ecker & Toomey, 2008; Toomey & Ecker, 2007; Schore, 2003; Siegel, 2006). Nevertheless, it is not conventional practice for neuroscience researchers to reference that body of knowledge.

In fact, reconsolidation research has already demonstrated that the process applies to many types of learning other than fear learnings—for example, appetitive (pleasure) learnings (Stollhoff et al., 2005), operant (instrumental) learnings (Exton-McGuinness, Patton, Sacco & Lee, 2014; Gallucio, 2005), spatial learnings (Rossato et al., 2006), object recognition learnings (Rossato et al., 2007), motor task learnings (Walker et al., 2003), taste recognition learnings (Rodriguez-Ortiz, De la Cruz, Gutierrez, & Bermidez-Rattoni, 2005), human declarative learnings (Forcato et al., 2007), human episodic learnings (Hupbach, Gomez, Hardt, & Nadel, 2007), and emotionally compelling human preferences (Pine, et al., 2014), among others. In fact, to my knowledge, as of this writing, all tested types of learning and memory have been found to submit to the process of reconsolidation.

That is extremely good news for psychotherapy, as the learnings that underlie and drive individuals' problems and symptoms are of many different kinds and not necessarily fear-based. Examples from my own practice of non-fear-based implicit emotional learnings brought into direct awareness include: the expectation to be allowed no autonomy, with reliance on secrecy and lying to maintain personal power; the heartbreak-laden memory of father abandoning the family when the client was 4 years old and the ensuing conviction that the cause was her own deficiency; and the expectation of severe devaluing and derision from others for any mistake or misstep, generating paralyzing states of shame and inhibition.

The second misconception in this category is this: In reconsolidation research articles, the authors typically comment that much more research must be done before it is clear how reconsolidation can be utilized in psychotherapy. This is hardly the case. In reality, for over a decade before neuroscientists' discovery in 2004 of the sequence of experiences that triggers reconsolidation (Pedreira et al., 2004), psychotherapists had been knowingly guiding clients through that sequence, having recognized from clinical observations that it was responsible for transformational therapeutic change (as described below). Furthermore, since 2006, psychotherapists have been translating reconsolidation research findings into successful therapeutic methodology. In 2006 I gave a keynote address to a conference of psychologists and psychotherapists (Ecker, 2006), describing the critical sequence of experiences that is required, according to reconsolidation research, for erasing a target emotional learning. In that talk, a clinical case example from my practice illustrated the guiding of that sequence and the resulting permanent disappearance of a longstanding, intense emotional reaction. In subsequent years, many articles and conference talks have presented the critical sequence in many clinical case examples of using it to decisively dispel a wide range of symptoms and problems (e.g., Ecker, 2008, 2010, 2013; Ecker, Ticic, & Hulley, 2012, 2013a,b; Ecker & Toomey, 2008; Sibson & Ticic, 2014).

Memory reconsolidation is the only known process and type of neuroplasticity that can produce the abrupt, permanent disappearance of a strong, longstanding, involuntary emotional and/or behavioral response, with no further counteractive measures required.

Note that according to current neuroscience, memory reconsolidation is the only known process and type of neuroplasticity that can produce what we have been observing clinically: the abrupt, permanent disappearance of a strong, longstanding, involuntary emotional and/or behavioral response, with no further counteractive measures required. So, in psychotherapy we have been guiding the same well-defined sequence of experiences and observing the same distinc-

tive signs of erasure as reconsolidation researchers have. We have applied the process successfully to the real-life, highly complex emotional learnings that underlie and maintain symptoms of many different types (see citations in the previous paragraph). Also, successful clinical use of protocols designed to induce reconsolidation and erasure have been reported by Högberg et al. (2011) and Xue et al. (2012). The latter demonstrated, in a controlled study, a strong degree of elimination of heroin addicts' cue-induced craving for heroin.

Thus the new era of the psychotherapy of memory reconsolidation is well underway. It had a curious birth: From 1986 to 1993, my clinical colleague Laurel Hulley and I closely scrutinized the occasional therapy sessions in our practices in which abrupt, liberating change had somehow occurred—the lasting cessation of a problematic pattern of emotion, behavior, cognition and/or somatics. Finally we identified a sequence of experiences that was always present, across a wide range of clients and symptoms, whenever such transformational change occurred. We developed a system of therapy focused on facilitating that key sequence of experiences right from the first session of therapy, and found that working in this way made our sessions far more consistent in producing transformational therapeutic breakthroughs. We began teaching this methodology in 1993 at a workshop in Tucson, Arizona, followed by our first published account of it in the volume *Depth Oriented Brief Therapy* (Ecker & Hulley, 1996). Subsequently the same sequence of experiences emerged in reconsolidation research, providing corroboration of our clinical observations by empirical, rigorous studies

Our psychotherapy system, now known as *coherence therapy*, guides the series of experiences required by the brain for reconsolidation and erasure to occur, creating transformational change (Ecker & Hulley, 2011). It is the only system of psychotherapy that explicitly calls for and maps directly onto the process identified in reconsolidation research, but there are many other systems of therapy in which the same process also takes place, albeit embedded within methodologies conceptualized quite differently. It is clear that no single school of psychotherapy "owns" the process that induces memory reconsolidation, because it is a universal process, inherent in the brain. In any therapy sessions, the occurrence of transformational change can now be presumed to mean that reconsolidation and erasure of the target response have occurred, whether or not the therapist was knowingly guiding that process. Toward confirming that universality, we began an ongoing project of explicitly identifying the embedded steps of the reconsolidation and erasure process in published case examples of various forms of psychotherapy (Ecker et al., 2012, chapter 6; for updated list, see http://bit.ly/15ZooHQ).

Thus, knowledge of memory reconsolidation can enhance the effectiveness of individual psychotherapists, but more importantly, it also translates into a unifying framework of psychotherapy integration, in which the many different systems of therapy form a huge repertoire of ways to guide the brain's core process of transformational change. This framework gives practitioners of different therapies a shared understanding of their action and a shared vocabulary for their action.

Knowledge of memory reconsolidation can enhance the effectiveness of individual psychotherapists and, in addition, it translates into a unifying framework of psychotherapy integration.

Misconception: What Is Erased in Therapy Is the Negative Emotion That Became Associated With Certain Event Memories, and This Negative Emotion Is Erased by Inducing Positive or Neutral Emotional Responses to Replace It

A case vignette from my psychotherapy practice will serve to illustrate the clinical guiding of memory reconsolidation and in particular it will show that the what is erased

by the process is not a therapy client's problematic emotion (or any other manifested symptom), but rather the learned schema or model of reality generating that emotion.

The client, a married woman, aged 50 and the mother of one child, sought therapy to dispel her aversion to sexuality with her husband, her depression, and her panic attacks, all of which had been afflicting her for at least a decade. I was using coherence therapy, in which the nonconscious, implicit emotional learnings that underlie and drive a given symptom are first brought into direct, explicit awareness, and then subjected to the process of memory reconsolidation and erasure, creating transformational change.

Session by session, into explicit awareness was emerging a complex array of underlying, implicit emotional learnings, some of which involved traumatic memories from various developmental stages of her life. In her first session I found that she would dissociate and become glazed and wooden in response to even a small step of interior exploration. She had a total of 45 sessions and was symptom-free at the end. This vignette focuses only on the particular emotional learning that emerged in her ninth session. This learning had formed when she was 18 years of age and had become pregnant by her boyfriend while living with her parents in a conservative town. She was living in shame and "desperate loneliness," did not want the baby or the boyfriend, and was struggling to decide about having an abortion when she had a miscarriage.

Wanting to find the emotional learnings she had formed in this ordeal, I gently guided her into experientially revisiting and reinhabiting that situation imaginally, and voicing her thoughts and feelings in present tense. This technique is often useful for bringing the implicit meanings of the original experience into explicit awareness. She seemed absorbed in the subjective reality of this material, and her voice was soft but somber as she said, "In this town, a girl who's been pregnant outside of marriage is just ruined, completely ruined."

In order to elicit fully and explicitly the learning she had formed, I asked softly, "What does 'ruined' really mean? What's going to happen to you now?"

After a silence, in an even quieter voice she said, "The rest of my life as a woman is ruined. I'll never marry, and I'll never have children." There it was, the specific learning she had formed. According to this learning, which had been implicit and outside of awareness for decades, having sex had results that had ruined the rest of her life. Immediately I understood that this dire model of her future was a potent source of both her depression and her sexual aversion.

With this clarity about the makeup of this target learning, I saw a possible way to create a contradictory experience: use of the brain's automatic detection of mismatches, a background process that is always scanning current conscious experience. So in reply to her words, I said, "Please say that again."

Somberly, and clearly feeling the emotional reality of the words, she said again, "The rest of my life as a woman is ruined. I'll never marry, and I'll never have children." As soon as she spoke the words this time, her wider conscious knowledge networks registered this information, which was new to her conscious networks though it was old in her implicit memory system. Her head made an abrupt movement, and in a sharper, louder voice she said with obvious surprise, "Wait—that's not true! I *did* marry! I *did* have a child!"

This first encounter between the target learning and vivid contradictory knowledge was the mismatch experience or prediction error needed for deconsolidating the target learning. This both-at-once experience of the target learning and vivid contradictory knowledge is termed a *juxtaposition experience* in coherence therapy to emphasize the

simultaneous activation of the two as co-present conscious experiences.

Note that in this instance, the mismatching knowledge—"I *did* marry! I *did* have a child!"—was familiar, ordinary knowledge that was very real to her experientially, as real and certain as her own existence, but it was not inherently emotional in quality. It would not normally induce emotional arousal by itself. For successful mismatch, the knowledge or experience utilized must feel decisively real to the person on the basis of his or her own living experience, but that does not require this mismatching knowledge to be emotionally arousing in itself, even though the target learning is strongly emotional

Presumably the neural encoding maintaining "My life as a woman is ruined, I'll never marry, I'll never have children" was now rapidly destabilizing, opening that set of learned meanings to being rewritten and erased by the knowledge, "I *did* marry! I *did* have a child! My life *isn't* ruined!"

She said in almost a whisper, "That just feels *huge*." Then her head tipped back against the top of her chair, and she gazed at the ceiling with blinking eyes. Then her eyes closed, and after about ten seconds she said, "I feel tingling and buzzing all over my body. It's weird—I can feel the skin between my toes. It's huge, it's huge." Internally she was repeatedly beholding and marveling at the new realization, which served as the several repetitions of it needed for rewriting the now deconsolidated target learning. For good measure, I soon created an explicit, out-loud repetition by jokingly saying, "I'm seeing an image of you running down the street waving your arms and shouting, 'I *did* get married! I *did* have a child! My life *wasn't* ruined!'" She laughed heartily at that, but even before I said it, her mood had shifted into a happy lilt that I had never seen in her before. Her contradictory knowledge was not emotional in itself, but the liberating effect of its use in the reconsolidation process certainly was.

I then reminded her that in our previous session she had raised a major question: "Why did I start feeling unbearable sadness and depression when I became pregnant with my son 13 years ago?" I asked her, "Does today's session help you see why?" Her eyes widened with this further powerful realization that the later pregnancy had revoked her emotional memory of the much earlier one, reimmersing her in the complex emotional miseries that accompanied that pregnancy and the miscarriage. She said, "Ohhh—that's an amazing insight."

After that session, her longstanding depressed mood was gone and did not return. This confirmed that the targeted learning had been producing that mood, and that erasure or dissolution of that learning had been accomplished—meaning that "I'll never marry, I'll never have children" no longer felt real or true in any memory network. Her depressed mood had been the conscious surface of the unconscious despair and grief generated by the target learning.

That session was also the beginning of the end of her sexual aversion, which was dispelled after several more sessions that revealed a number of other episodes in her life where great suffering had resulted from or accompanied sex. Finally she no longer felt any urge to avoid her husband's overtures, though she did feel vulnerable and cautious about entering into a new level of sexuality with him. Those of course were natural, appropriate feelings, and I coached her on expressing to him her need for him to sensitively honor her pace and her cues.

Her panics attacks proved to be based in yet other emotional learnings. They ceased after the discovery and dissolution of those other learnings through juxtaposition experiences tailored to them.

The vignette illustrates the lifelong durability of original emotional implicit learnings or schemas, as well as their dissociated, encapsulated state, which keeps them insulated from and immune to new experiences and new knowledge formed later in life. By being retrieved into conscious, explicit awareness, emotional implicit learnings become fully available for contact with other, disconfirming knowledge that can induce transformational change through juxtaposition (mismatch) experiences.

Thus, for consistently guiding decisive change through the reconsolidation process in therapy, the required reactivation of

a target learning has to be its reactivation *as a conscious, explicit experience of the retrieved, specific elements of the target model* (such as "I'll never marry or have children, so my life as a woman is ruined"), not merely the retriggering of a still nonconscious, unretrieved implicit schema. Such implicit learnings are often retriggered in day-to-day life *without* conscious awareness, and often life also provides strong disconfirmations, but because the schema remains outside of awareness, there is no juxtaposition experience—no conscious coexperiencing of both the old and new knowledge of what's real—and therefore no change takes place.

As this clinical example shows, what is erased through the reconsolidation process is a specific, learned schema or model or template of reality, verbalized in the example as "I'll never marry or have children, so my life as a woman is ruined." That schema was the target for erasure, and the mismatch that deconsolidated and then nullified it consisted of experiencing a sharp disconfirmation of that specific schema. With dissolution of the schema, the negative emotions that it was generating (despair, grief, and depression) disappeared, though those emotions were not themselves the target for mismatch or erasure, and the mismatch did not consist of creating a positive or neutral emotion instead of despair and depression.

Notice also that the client's negative emotion was arising directly from her existing model of the rest of her life, not from episodic memory (event memory) of the traumatic pregnancy and miscarriage. In other words, the traumatic experience resulted in her model (which is semantic memory), and that model in turn generated and maintained her emotional symptoms. Erasure of that model caused no loss of autobiographical memory.

Therapy clients' unwanted symptoms and problems are of course not limited to negative emotions, but can also be behaviors, thoughts, dissociated states, somatic sensations or conditions, or any combination of these. In any case, the target for erasure is not the manifested symptom or problem. The target is the learned implicit schema or semantic structure that underlies and drives production of the symptom. Erasure occurs when the target schema is activated as a conscious, explicit experience and is directly disconfirmed by a concurrent, vivid experience of contradictory knowledge. In other words, erasure does not occur simply through evoking a nonsymptomatic state when normally the symptom would be occurring (One important exception to that rule is the learned fear of fear that often accompanies phobias.). The occurrence of a symptom does not in itself bring the underlying, symptom-generating schema into conscious, foreground awareness, as is necessary for guiding the erasure process in therapy, so methods for evoking a nonsymptomatic state are not likely to disconfirm the underlying schema. The woman in our example might arrive at a session in a depressed mood, and there are techniques of somatic therapy, positive psychology, or mindfulness practice that could be used to shift her into a depression-free sense of well-being. However, that would not disconfirm and dissolve the underlying implicit schema maintaining her depression, "I'll never marry or have children, so my life as a woman is ruined." Her depression would therefore recur.

An example of the misconception that negative emotion is erased by inducing positive or neutral emotion is the view of Lane et al. (in press) that "changing emotion with emotion" characterizes how the system of psychotherapy known as emotion-focused therapy carries out reconsolidation and erasure. Rather, "changing old model with new model" is the core phenomenology of erasure through reconsolidation in any system of therapy. Emotions then change *as a derivative effect* of change in semantic structures (models, rules, and attributed meanings), just as in our example the client's depression disappeared as a direct result of dissolution of her target schema. In therapy, mismatch consists of, and erasure results from, a direct, unmistakable perception that reality is fundamentally different from what one currently knows and expects reality to be.

Conclusion

The profound unlearning and cessation of acquired behaviors and states of mind occur through the process of memory reconsolidation, to the best of our current scientific knowledge and as extensive clinical experience bears out. However, there are many possible misconceptions of memory reconsolidation (see Ecker, 2015 for an extensive review), so I hope this article will help motivate mental health clinicians to pursue a sound understanding and thereby gain a vital guide for facilitating lasting, liberating change with maximum regularity.

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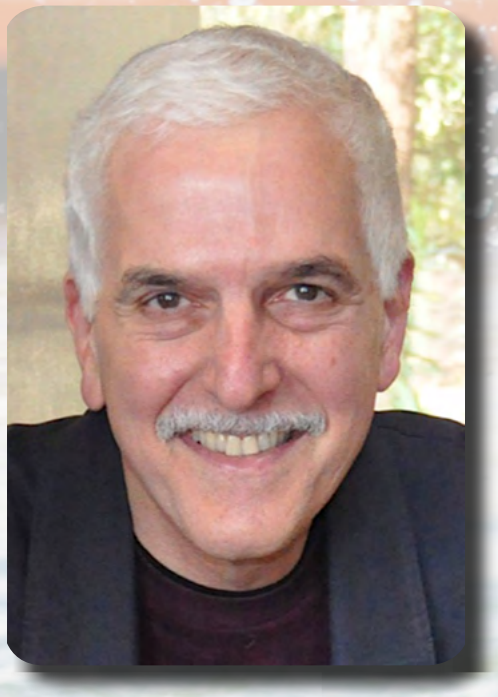

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DEEP RELEASE FOR BODY AND SOUL:

MEMORY RECONSOLIDATION AND THE ALEXANDER TECHNIQUE

Robin Ticic
Elise Kushner

Victoria*, a robust and optimistic woman in her late twenties, had just quit her job in Manhattan in anticipation of moving to California in two weeks' time. Her aunt and uncle there had offered her an interesting position in their family business, and Victoria was ripe for a new adventure.

She lived in a 5-story apartment building typical of the residential neighborhood in which she had spent the last several years. The neighbors were mostly middle-class, white-collar workers who were out at the office during the day, as she herself had been until recently. Now, somewhat oddly, she was home during the day, packing and sorting, carrying huge plastic bags full of old belongings down to the garbage bins, going in and out to shop—an entirely unaccustomed rhythm.

Returning home from a short errand around lunchtime, Victoria sensed someone behind her as she approached the entrance to the building. She glanced over her shoulder, having been well trained in matters of safety and security. She saw a young man, probably in his early twenties, dressed in dark jeans and a red T-shirt. He was of an ethnic minority atypical of the neighborhood. Her instinct told her he was up to no good, but her life-long liberal training overruled the feeling, saying that it wasn't right of her to stamp him as evil just because he looked different. Rather than make an effort to shut the door quickly behind her, Victoria allowed him to follow her into the building. The man murmured that he was there to visit his brother, and he stopped outside a door on the second floor, as she continued up to her apartment on the third floor.

Once in her apartment, she felt the rumbling in her subconscious that was trying to tell her that she had never seen a tenant of that ethnic appearance in the building and that the man most likely wasn't visiting his brother. But again her learned habit of "bending over backwards" on issues of racial tolerance squelched the inner voices.

A half-hour later, Victoria went out again on an errand in the neighborhood. Walking homeward at an atypically slow pace, she felt burdened by a sense of doom. But her irrepressibly positive nature refused to deal with it.

She entered her building and climbed the first one-and-a-half flights of stairs. Waiting there at the top was the man who had followed her in earlier that day. She tried to turn back toward the downstairs door, but he grabbed her wrist and dragged her the rest of the way up to the landing. He had figured out which apartment was hers and shoved her toward the door.

"Open the door!" he commanded. Some instinct told Victoria to be passive and not react. He punched her in the face and knocked her glasses off. "Open it, I said!" he repeated.

"I can't! I can't see anything," she answered. He gripped her from behind, using his left arm as a vise around her neck. With his right arm he reached down, as if to pull something out of his sock.

"I have a knife. Open the door now," he said. He squeezed harder around her neck as she tried to make some sounds, and he punched her with the other hand. She didn't actually see the knife, but she could imagine it clearly.

Victoria let herself become very heavy and uncontrolled, so that the man had quite an effort to hold her upright. The more she tried to scream, the harder he squeezed against her throat.

"Give me the keys!" he said. She handed him her key ring, which, luckily, contained at least fifteen

Victoria is a pseudonym. The client is not recognizable from the text and has given her informed consent.

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keys: for her own apartment, her brother's apartment, the apartment of a neighbor, the cellar where the garbage cans were, a dance rehearsal room, her parents' country house . . . While the attacker was wrestling with the keys and simultaneously trying to keep Victoria upright, she took the opportunity to collapse in a helpless heap on the floor. At that moment, voices from farther upstairs became audible. There *was* someone at home during the day—someone who was not responding to her screams!

After what seemed like an interminable number of minutes, which Victoria was convinced were her very last, she suddenly sensed he might be losing patience and giving up. She shoved her purse at him and said, "Just take the money and go!" That is what he did.

She listened for the slamming of the downstairs door before picking herself up gingerly and creeping soundlessly up the stairs. She rang at every apartment until finally an old woman opened her door, let Victoria in, and called the police on her behalf.

Later at the police station, having described the man and her stolen purse, Victoria was led to a patrol car and driven around the neighborhood, on the chance that the man might still be nearby. At one point she believed she saw the culprit disappearing between two buildings but was unsure of herself. Back at the police station, she was asked to look through mug shots, which she found to be an extremely depressing experience. It felt to her as if all the evil men in New York City were looking out at her as if they wanted to harm her. These chilling photos were having an emotional impact of their own. She now feared she might never again be safe in this city. One photograph in particular triggered a feeling of horror in her, but she wasn't sure if it was her attacker, since she had hardly seen him from the front. She read that that one was wanted for many crimes, but had never been convicted.

Victoria was no longer able to go into her building or be in her apartment alone during the two weeks remaining before her move. A friend of her brother was between jobs and offered to be her bodyguard until she moved. During these two weeks she spent tortuous hours and days berating herself for having brought the situation on herself by stupidly letting the man into the building. At the same time, she was overjoyed just to be alive!

The nightmares began immediately, and it was always the same. She was walking through her Manhattan neighborhood when she noticed that she was being followed by a man who looked like her attacker, and who was wearing a red shirt. She tried to go more quickly, but her legs were too slow, as if she were trying to run in a swimming pool full of molasses. She felt incapable and hopeless. She panicked and screamed, which woke her up.

She was sure that her fear was specific to that man, and that it would be gone once she had moved from Manhattan, but that was not the case. The nightmares continued, although she was living near her relatives in a small town in California, where she felt quite safe.

For the next 10 years, Victoria enjoyed her new life, new job, and new friends, and was happy on an everyday basis. A few things had changed permanently for her, however: she studiously avoided unsafe neighborhoods and tried not to go out alone after dark, she could not stand to have anyone touch her neck playfully in a mock-aggressive way, she began to listen more consciously and respectfully to what her instincts were telling her about people, and she had a newfound appreciation of the fragility of life and swore to make every minute count. Nonetheless, the Manhattan nightmare continued, night after night. Often she didn't remember in the morning that she had dreamed the horrible dream, but on some level she knew that it was a nightly visitor.

During this time, Victoria's beloved cousin Belle, who lived near her in California, had trained as an instructor of the Alexander Technique (Jain, Janssen, & DeCelle, 2004; Munden & Harer, 2009). This soft-bodywork approach emphasizes feeling at ease in one's movements, and Belle was a natural talent at it, so Victoria offered herself from time to time for Belle to practice with her.

One day, Victoria asked Belle to do a few minutes of hands-on work with her for a stiff neck, very sure it would help her release some tension. While one of Belle's warm hands was cupping her chin and the other was at the back of her neck, gently swiveling her head, Victoria suddenly remembered that she had the same nightmare every night. She told Belle about it and said it had been happening nightly for the last ten years. At that moment, Victoria felt a rush of muscular release in her neck, as if she could breathe freely again, though she hadn't been aware of not being able to breathe freely. She felt utterly safe in her cousin's hands.

The recurring nightmare stopped immediately, that very night. After a few weeks Victoria started trusting that it was really gone. Only once, many years later, did it return, after an intense recounting of the original traumatic event.

***

What took place in Victoria's body and mind during those pivotal moments to cause that rapid, profound shift? It proves instructive to examine the change that occurred through the lens of *memory reconsolidation*, which is the only type of neuroplasticity known to be capable of unlocking and modifying an emotional learning at its neural roots.

The brain requires a particular set of experiences in order to launch the process of memory reconsolidation: the target learning or "knowing" must be reactivated by the presence of salient cues from the original learning. While that learning is reactivated, an experience must take place that significantly mismatches what is expected and predicted by the target learning. In response to this mismatch, the synapses that encode and store the target learning shift into an unlocked, labile state in which they are open to being updated by new learning, allowing prior learning to be nullified and erased (for research reviews, see Agren, 2014; Reichelt & Lee, 2013; for the utilization of memory reconsolidation in psychotherapy, see Ecker, Ticic, & Hulley, 2012, 2013a,b). The liberating shift that Victoria experienced can be understood in terms of that process, as follows.

What learnings had Victoria formed during her traumatic experience in Manhattan, 10 years earlier? As verified by Victoria herself, these nonverbal, implicit learnings can be verbalized as follows:

- Danger lurks everywhere, so I must remain vigilant at all times.
- I can't rely on help in a life-threatening situation.
- When alone I am particularly unsafe.
- When sleeping I cannot be vigilant, cannot protect myself, and am therefore vulnerable to the utmost extent.
- If I ignore my instincts, I endanger myself.
- What happened to me is my own fault, because I didn't heed my own feeling of danger.
- Someone touching my neck means that person intends to put my life in jeopardy.
- I must protect my neck by always holding it firmly under my control.
- Manhattan is full of horrible, mean men who want to do terrible things to me.
- Parts of this experience are too horrible and destabilizing to allow entirely into my conscious awareness.

During the Alexander session, Belle's hands were on Victoria's neck. As she focused on those sensations and the feeling of moving her neck, all at once the body memory of feeling strangled became activated and entered Victoria's conscious awareness. And yet she felt utterly safe in Belle's loving hands, and felt absolutely safe in letting down her guard. On the nonverbal level of body knowledge and emotional meaning, this was a vivid mismatch of Victoria's learnings and expectations that "Someone touching my neck means that person intends to put my life in jeopardy" and "I must protect my neck by always holding it firmly under my control." At that moment of disconfirmation, those learnings lost their chokehold on Victoria, literally as well as figuratively.

Why, then, did the nightmares cease immediately, as well? Victoria's sense of complete safety and loving, empathic accompaniment by Belle enabled her to reveal to Belle—and, even more importantly, to herself—certain previously unspoken, suppressed aspects of the ordeal that she had known "on some level" all along, as she said, including the nightly reliving of life-threatening danger. Opening up to the full experience in this way and yet *not* being destabilized by doing so constituted an additional mismatch, in this case with her established learning that "Parts of this experience are too horrible and destabilizing to allow entirely into my conscious awareness." Victoria's awareness of the experience in Manhattan was now sufficiently de-suppressed that there no longer existed intense, out-of-awareness memory that could intrude while her guard was down during sleep.

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Looking back on these dramatic, decisive shifts, Victoria felt that a particular *portion* of her learning that "Danger lurks everywhere, so I must remain vigilant at all times" and a particular *portion* of her knowings about how unsafe it was to be alone—especially alone and *sleeping*—no longer held any emotional validity or realness after that one Alexander session. She could now assess, with awareness and mindfulness, the degree of risk in a given situ-

ation, and protect herself accordingly, without feeling that danger lurked everywhere. She observed with regret, however, that she lived in a society in which one could not assume that neighbors would respond with support in time of need.

What enabled these additional shifts to occur? In hindsight, Victoria recognized that the activation of the memory by Belle's hands on her neck included the reactivation of other component learnings listed above. (As a rule, the activation of portions of a schema—in other words, some subset of the knowings formed during a particular experience—activates the entire schema.) And yet Victoria possessed the everyday knowledge that danger is *not* necessarily omnipresent and that she is indeed capable of taking measures to protect herself to a significant extent. This everyday knowledge came into direct juxtaposition with the learned omnipresence of danger that Victoria had formed during her ordeal, serving as yet another mismatch and disconfirmation.

Interestingly, Victoria's learning that "If I ignore my instincts, I endanger myself" did not shift at all. On every level of her being, she chose to retain that new knowledge because it felt completely valid and survival-positive. This type of shift in one's way of being and worldview is a frequent outcome of traumatic experience, even after that experience has been fully processed and integrated into the fabric of one's personal history. Victoria's sense that "What happened to me is my own fault, because I didn't heed my own feeling of danger" softened into "Yes, it was my responsibility to honor my inner voices, and I didn't do that. I learned the hard way, and now I'm more alert to my invaluable inner promptings. I'm better able to protect myself."

Victoria described the final time her nightmare occurred, many years after it had otherwise ceased totally, as a kind of recognition that "Oh, that's right—all of that *did*, in fact, happen to me. And it was really horrible!"

What a fascinating cascade of neurological and subjectively experienced changes was made possible by a single session of work with the Alexander Technique! Awareness of the process of memory reconsolidation and the experiential steps necessary to set that process in motion enables us to begin to understand what is actually happening when such meaningful shifts occur implicitly—as they did for Victoria.

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Progressive Counting Facilitates Memory Reconsolidation

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Memory reconsolidation is a central element of certain psychotherapy approaches. Progressive counting (PC) is a recently developed trauma treatment that has performed at least as well as eye movement desensitization and reprocessing (EMDR) in two comparisons. Presented here is a case study of PC, as used within a phase model of trauma-informed treatment, to illustrate how it facilitates memory reconsolidation.

Progressive counting (PC) is a new trauma resolution procedure that has so far been found to be about as effective as EMDR (Greenwald, McClintock, & Bailey, 2013; Greenwald, McClintock, Jarecki, & Monaco, in press), at least as well tolerated, and more efficient (Greenwald, McClintock, Jarecki, & Monaco, in press). In brief, the PC procedure requires the client to watch a movie in their mind of the targeted trauma memory, from beginning to end, while the therapist counts out loud, first from 1 to 10, then to 20, then to 30, and so on, until no further memory-related distress remains (Greenwald, 2013a).

Memory reconsolidation, a neurological process that allows existing emotional learning or conditioning to be erased, technically requires: 1) activating the target learning, 2) destabilizing the activated learning with a disconfirming experience that renders the target learning erasable, and 3) carrying out erasure by guiding a few more disconfirming experiences within a 5-hr window (Ecker, Ticic, & Hulley, 2012). This sequence of activities occurs within PC proper. If therapy clients were to just walk in already prepared to engage in memory reconsolidation work, the practice of therapy would be far simpler. However, in order for that process to take place reliably, it needs to be preceded by: (a) symptom identification; (b) retrieval of target learning (i.e., the symptom-requiring schema); and (c) identification of disconfirming knowledge—steps that are accomplished in quite different ways in different forms of psychotherapy, as shown by Ecker et al. How PC carries them out is illustrated by the case example below.

The PC treatment model implicates unresolved trauma and loss memories (broadly defined), and associated mental models, as the primary underlying basis for most clients' presenting problems. Thus, consistent with Ecker and colleagues' metamodel of therapy approaches that facilitate memory reconsolidation (Ecker et al., 2012), it is a generic or trans-diagnostic treatment approach that allows clinicians to address a wide range of presenting problems (Greenwald, 2013a).

Although the model is routinely used within the traditional hour per week therapy format, in our clinic we provide therapy in an intensive format, in which the client works with the therapist for many hours per day, typically for consecutive days, until the work is done. This allows for greater treatment efficiency, reduces the risk that therapy will be disrupted by life events, and yields rapid results (Greenwald, 2013b). Within the intensive format, certain phases of treatment are performed out of their usual order because most clients are not returning to their home environments each day after treatment. So, for example, strategies to cope with everyday challenges would normally be addressed relatively early in treatment, but in the intensive format these are postponed until near the end, when the client is getting ready to return home.

Here we present a (disguised) case of the first author's (KL) to illustrate how the process of memory reconsolidation unfolds using PC within a phase model of trauma-informed treatment—including evaluation, motivational work, psychoeducation, emotional stabilization, coping skills, trauma resolution, and anticipating future challenges—which is the context within which PC is most likely to be provided (Greenwald, 2013a).

Case Example

"Sara", a self-referred 30-year-old recently married female, traveled cross-country to meet with KL for three consecutive days. When asked what brought her to treatment, Sara described her feel-

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ings of loneliness and longing for more quality time with her husband, Matt; this had gradually been getting worse during the last several months of his 70+-hr working weeks.

Sara described a recent situation with Matt in which "we planned to watch a movie together when he got home from work, but he came home late and said he was too tired to watch a movie, and he needed to get to sleep". Then, instead of Matt apologizing or comforting her, "he went off about how stressful his life is right now and then went on talking about a project he was doing at work". In this way the conversation had shifted from a focus on Sara's needs to Matt's needs, and Sara "just listened to what he had to say". Sara became increasingly irritated with Matt towards the end of the night and finally decided that she needed some space, opting to sleep on the living room couch; however, "Matt wouldn't give me my space and insisted we sleep together". Sara also mentioned that Matt had seemed worried that he had done something wrong and insisted on making it right. Sara did not provide him with an explanation, and the night ended with Matt retreating to the bedroom and Sara falling asleep in the bathroom after having locked the bathroom door to get away from him.

Sara went on to explain how emotionally overwhelmed she felt about the relationship and expressed ambivalence about how best to address this. She explained, "I am not sure if I want to stay with him and work on the relationship, or if I should leave him". Sara felt that she had tried so hard to make the relationship work (e.g., she had convinced Matt to attend couples therapy, which they had been attending weekly for six months) that she couldn't imagine giving up on it yet. On the other hand, she also felt, "I can't keep going the way things are. It is exhausting". Thus Sara had come to the realization that she was really stuck, and she said, "I was hoping that by coming here I would be able to figure out which choice I need to make".

KL learned that Sara had experienced chronic childhood emotional and physical abuse, inflicted by her father, while mother was "emotionally absent". Further details of the abuse and its relationship to Sara's current level of functioning in her marriage were ascertained as treatment unfolded.

When asked about her long-term goals, Sara said:

> Ideally, I would have a better and more intimate relationship with Matt. There would be less conflict because Matt would be spending less time at work and more time with me. When I suggest something that would be helpful for our relationship, he would actually listen and follow through with it.

Sara did not yet appear to recognize her own role in her problem or the solution, so she was asked to identify any of her own behaviors that could get in the way of her goals. Sara acknowledged:

> It is not just him that needs to change. I know that I play a part in this too. I keep asking Matt to make changes that will help our relationship, and when he doesn't follow through, I still keep thinking that eventually he will, and I continue to ask him over and over. I hold on to an unrealistic expectation that he will change in certain ways, and even when he doesn't change I convince myself that he eventually will.

Sara also acknowledged that she was a highly sensitive person, and that sometimes she responded to Matt in ways that provoked him or discouraged him from making changes "because of his fear that screwing up might cause me to become really distressed and irritable". Sara explained:

> When Matt disappoints me or upsets me by dismissing something I am feeling or saying, I can't really tolerate it, so I just bottle things up inside and try to push these feelings away by focusing on Matt's needs instead. Then I become really overwhelmed, and then some-

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times I just try to isolate myself, or I just explode at the most unexpected times.

This contributed to step a, symptom identification.

Sara was then asked to identify any behaviors that could move her towards her goals. Sara said that she would like to be able to:

> . . . stick up for myself and let Matt know how his words have hurt me. I wouldn't accept his treatment towards me as it has been for a while. Things would have to change; and if Matt didn't change, I would stop holding on to unrealistic hopes, and I would have to move on with my life without him.

Through this discussion, Sara had begun to approach the symptom-requiring schema (step b) underlying her current behavior/symptom of bottling things up inside and responding to Matt's needs in response to an emotional invalidation. The schema involved beliefs, likely rooted in earlier childhood experiences with Sara's father, which discouraged Sara from confronting Matt directly about his behavior, along with an expectation of getting her husband to change. While we might speculate that Sara believed something like, "If I want to be safe, loved, and accepted, I have to prioritize the other person's needs over my own", this treatment approach does not require the client's problematic mental model(s) to be made explicit as this point. Rather, both step b, the explicit accessing of target learnings, and step c, the accessing of vivid contradictory knowledge, develop organically throughout the unfolding PC process, as shown below.

The explicit accessing of target learnings and the accessing of vivid contradictory knowledge develop organically throughout the unfolding PC process.

A trauma/loss history was obtained from Sara. For each memory that Sara identified, she also reported the age at which each event occurred and gave a current subjective units of distress scale (SUDS; Wolpe, 1990) 0-10 rating, in which 10 is the highest possible distress and 0 is none at all. Sara identified several memories, which appeared to be thematically related regarding experiences of invalidation, where another person (usually Sara's father) either expected more of Sara than she could provide, or dismissed Sara, or misinterpreted Sara's cues that were indicative of distress. Sara did not yet appear to be aware of this underlying theme that had been woven into her interpersonal relationships.

Then the case formulation was presented. This is the culmination of the evaluation phase of treatment, in which the therapist teaches the client how their trauma/loss history contributes to the presenting problem (Greenwald, 2013a). Sara's strengths and resources were first highlighted, and then her trauma/loss experiences were acknowledged. The therapist then explained:

> Other people who have experienced events like those have said that they learned to believe bad things about themselves that aren't actually true, but which feel true sometimes; things like, "I'm not important; I'm powerless; I'm not safe". Other people have also said that when things like that happened, there were strong feelings like anger, shame, sadness, or fear. Those feelings can pile up inside and can be like a sore spot. Now, whenever someone dismisses your own needs or perspective I can't help but wonder if it might be hitting that sore spot. Like the other night when Matt answered you by talking about himself. Nobody likes to be disregarded; it would bother anyone at least a little. But if it hits the sore spot, the reaction could be much stronger. Most people have trouble with such strong emotions and will try to get rid of them. You pushed your feelings out of the way, listened to Matt, and then locked yourself in the bathroom. Do you think this might be what's happening with you? Have people ever told you that you react more strongly than they think you should?

Sara responded:

> A lot of people, including Matt, think my responses are off sometimes. I even think that I react too strongly sometimes. This does make sense . . . I can see how my childhood experiences set me up for this.

This constituted the completion of step a, symptom identification, and a limited degree of step b, retrieval of target learning.

Based on the case formulation, the therapist recommended trauma resolution work as well as directly addressing certain challenging life situations

in support of Sara's goals. Sara agreed to this and subsequently began trauma resolution work via PC.

The first cluster of memories to be targeted involved Sara's father. Sara was asked to focus on the earliest one first, an age 3 memory in which Sara's father spanked her to the point that she had an open sore on her buttocks. Prior to starting PC, this memory was rated as a 10 on the SUDS scale. Sara was guided to come up with a beginning picture before the bad part started and an ending picture after the bad part was over. Sara was then instructed to watch the whole movie in her mind from beginning to end, while KL counted out loud.

The first movie was to a count of 10, after which the therapist asked how bad the worst moment felt on the 0-10 SUDS scale. Sara reported a SUDS of 2, because the movie was so quick that Sara "could not experience the movie fully; vividly". The next movie was to a count of 20, and had a SUDS of 8. Sara become flushed, with tears running down her face, and said, "How could he do this to me? Why would my mom let him do this to me? I was so young and so helpless". Thus, step 1 was accomplished, in that the memory appeared to be activated and, along with it, core beliefs and models formed on the basis of the experience being revisited.

Several movies later, Sara reported a SUDS of 5 and, in tears, exclaimed:

> He was always so controlling. I was always expected to eat my dinner a certain way, wear clothes that he liked, engage in sports activities that he wanted me to do, and to behave like a perfect child. And I could never really speak my mind with my father without getting punished for it. If I did anything to go against his hidden rules, because he did have special rules for me that my other siblings didn't have, then he would punish me, but this time was really bad and I didn't deserve it. He was not like other fathers. All the fathers I have known have never punished their children as severely as he punished me. I just didn't know then what I know now. At least he can't control me anymore.

This indicated the introduction of contradictory information (e.g., "my father was the problem, not me" and "he can't control me anymore"); thus step 2 was accomplished, destabilizing the target learnings that were being disconfirmed.

Note that within PC the contradictory and corrective information is typically spontaneously generated by the client. However, the identification of the beginning and ending picture for the movie can sometimes also serve as corrective information, insofar as conveying that the bad part is over might get this done. In this case, for example, Sara said, "At least he can't control me anymore".

In the next movie, Sara reported a SUDS of 1.

"I don't know if I am doing something wrong, but the memory just feels distant now. Like I am detached from it or something"

Sara then spoke of the relationship she had developed with a close uncle:

> He taught me about relationships in a different way than my father. He always cared about what I had to say, and often asked for my opinion on things. We had a pretty strong relationship, which really developed out of that first time I sat on his knee when I was six, and he encouraged me to talk about what was upsetting me. Not all relationships are just about pleasing the other person. It feels good to give, but it also feels good to receive, and that's okay. He taught me that.

This was one instance of step 3, in which further corrective information was introduced (i.e., loving people care about your needs and value your thoughts and opinions; healthy relationships are built on both giving and receiving). Instances of step 3 continue, either with the same insight or new ones, during consecutive movies, though the client is not required to articulate each realization.

Four movies later, Sara reported a SUDS of 0, and she said, "I don't know if I am doing something wrong, but the memory just feels distant now. Like I am detached from it or something". The therapist reassured Sara that her brain knew exactly what to do. Sara displayed signs of emotional non-reaction to the traumatic memory itself (e.g., the memory felt distant; she felt detached from it). This began fulfilling the final step of verification of erasure defined by Ecker et al. (2012), which consisted of observing key markers of transformational change: former cues no longer trigger reactivation, symptoms cease completely, and these changes persist effortlessly.

Even at a SUDS of 0, PC continued for two more movies until Sara reported no further changes, in-

dicating that the trauma resolution work for that memory had been completed. Sara appeared curious about the ways that her unresolved issues with her father tied into her present level of distress in her current relationship, but she preferred to keep moving forward with more PC at that moment.

Sara was then guided to work on the worst memory of the father cluster (the sequencing of memories to be treated as per Greenwald, 2013a):

> I was complaining over several weeks about having some back pain, and then one day, after I told him that I couldn't do my chores because it hurt so bad, he snapped. He forced me to carry a bag stuffed with 45 pounds of weight, wherever I went, for an entire Saturday. By the next morning, my back pain became so severe that I had to go to the hospital. It turned out to be an untreated injury from when I got hurt in gymnastics, which was then (finally) treated with non-invasive surgery. My back pain went away within several days following surgery.

Sara rated the memory as a SUDS of 7. The first and second PC movies each had a SUDS of 2, and then the third movie had a SUDS of 5. Sara, again flushed, reported:

> My father wanted me to suffer like he suffered as a child. It was just him unknowingly recreating his own childhood through me. I get that now. But the fact that my back pain could have been easily addressed and treated, and my father chose to dismiss it, is still difficult to wrap my head around. It is easier to watch the movie now, but it still hurts.

The PC continued for several more movies until Sara got to a SUDS of 0 with no more changes. Sara said:

> You know, I have spent the last thirty years seeing the world through this distorted filter thanks to my dad. I feel like this is the first time I am actually seeing the world through my own eyes with no filter. I realize now that my responses to Matt are actually based in fear, in the same way that they were based in fear when I was a child responding to my father. And somehow this fear has caused me to push my needs aside by stuffing them deep within and focusing on the other person's needs instead. I am always trying so hard to take care of and accommodate other people, even at a cost to myself. Now I get why. It's like I am trying to protect myself from some unknown danger. Despite all this, and as weird as it may seem, I really think I can forgive him now; and that feels quite liberating.

In Sara's comments are indications of how the retrieval of target emotional learnings (step b) continues through the PC process along with accompanying emergence of disconfirming knowledge (step c), resulting in steps 1, 2, and 3 occurring and dissolving the target learnings in a natural manner.

Sara continued to make further connections between her relationship with her father and her relationship with Matt. Sara began thinking about her "desire to please Matt and make him happy". She said:

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I take care of all the household responsibilities—preparing meals, doing the dishes, laundry, and caring for our dog—and all this even while maintaining a full-time job, albeit 30 hours less a week then Matt's 70-hr week. And I do all this because it is how I learned to be in a relationship. Until now, it was all I knew. But I realize that it is just me recreating my relationship with my father, in this endless quest to secure his love and affection.

After all of Sara's key memories with her father were processed with PC, the other memories that had been identified on Sara's trauma/loss list were each processed as well. These took a much shorter amount of time than had been required for the memories of her father, likely because the core issues had already been worked out (consistent with Ecker et al., 2012, as well as Greenwald, McClintock, Bailey, & Seubert, 2014). Interestingly, when it came time to process the three memories involving Matt, Sara's SUDS ratings had decreased significantly compared to the initial ratings (also consistent with Greenwald et al.). For example, Sara's earliest upsetting memory of Matt (involving him publicly embarrassing her) was a SUDS of 10 when completing the trauma/loss history; however, just prior to treating this memory, the SUDS was already down to a 2.

By the afternoon of the third day of therapy, all identified distressing memories had been treated to resolution. The final task was to identify some anticipated challenging moments and practice the desired coping strategies in imagination. Therapy was completed by the end of the third day, with plans to check in by phone two weeks later.

At the telephone follow up, Sara was asked about her emotional reactions to the previously identified trigger situations. Sara said:

Now that I am finally seeing the world through my own eyes without any distortion, I realize that I used to attract the wrong kind of people into my life, and because of this I was always in distress. I attracted people who were never able to give me the love, affection, and validation I so desperately desired. I would lose myself in the relationship, even dismissing my own thoughts and feelings in order to focus on pleasing them. It makes me so sad to think that I never felt my thoughts and feelings were important enough to discuss in my relationships. But it wasn't just that my thoughts and feelings were not important, it was that I was used to being punished for expressing them, and this fear has never escaped me until now. My enduring efforts to please others while dismissing my own needs eventually led to me feeling really burnt out and unable to tolerate those situations with Matt any longer, which is why I think I ended up pursuing treatment.

With some further prompting for specific examples, Sara replied:

Well, I don't have to try so hard to please Matt, or anyone, for that matter. A perfect example is the other night when Matt came home late from work. Instead of doing the usual cleaning routine, or spending hours making Matt's favorite dinner, I decided to go out for dinner and a movie with some of my friends. When I returned home, Matt was sitting in the living room all pissed off and immediately started laying into me about dinner. I told him that I had brought him home leftovers, so that he would know that I was at least thinking about him. But, you know what? Matt was actually disappointed that I had not slaved in the kitchen for him. I was not in the least bit surprised by his response and, honestly, it did not ruffle my feathers in the least bit. Instead of appeasing him, I just let Matt know that I felt that he had taken me for granted. When Matt tried to make the conversation about his needs, which is so typical, I just calmly said to Matt that his needs are important to me, but so are mine. The conversation ended with Matt storming off to another room and me letting Matt know that I still love him, even though I was unhappy with his behavior.

Now that I am finally seeing the world through my own eyes without any distortion, I realize that I used to attract the wrong kind of people into my life, and because of this I was always in distress.

Sara continued:

I realize that it was the old me who picked Matt as a partner. Although being with Matt has always been difficult, the difficulty was familiar to me and easy to accept at the beginning. I got stuck in this pattern of giving everything

and then being accepting of not receiving anything in return. Somewhere deep in my unconscious, I guess I thought that this is what love was about. Now I am able to consider myself more. I have a better idea about what constitutes a healthy relationship vs. a destructive relationship, and I can more easily avoid or remove myself from the destructive ones. I have devoted more energy to taking care of myself and less energy trying to please others who take me for granted. Because of all this, I feel really good, and am noticing how much healthier and less stressed I feel. A big weight has been lifted.

The memory reconsolidation process can be considered successful based on the verification of schema nullification in which Sara demonstrated emotional non-reactivity in response to trigger situations that previously activated the schema. For example, she said, "It did not ruffle my feathers in the least bit". Symptom cessation was indicated with, "Instead of appeasing him, I just let Matt know that I felt like he had taken me for granted". Effortless permanence of Sara's symptom cessation and emotional non-reactivity was indicated with, "I feel really good, and am noticing how much healthier and less stressed I feel. A big weight has been lifted".

Discussion

This case illustrated how PC, within the phase model of trauma-informed treatment, accomplished the memory reconsolidation process described by Ecker and colleagues (2012). The preparatory portion of this treatment helped the client to identify her symptoms and to be willing and able to engage in the trauma resolution work itself. The structure and process of PC guided the client to activate her memory of specific traumatic events and then, by attending to her experience in those events repeatedly through the movie viewing process, to become progressively aware of mental models and attributed meanings that she had formed in those events and that were still governing her perceptions and responses in the present. This in turn induced spontaneous recognition of her own vivid, contradictory knowledge, which disconfirmed and erased the longstanding schemas maintaining her emotional and behavioral symptoms. Although Sara was able to articulate these mental processes, we have seen many other PC clients who were not so articulate, yet experienced equivalent outcomes.

PC does not require the client to be insight-oriented or to be able to articulate the mental models that they may wish to change. As long as the preparatory portions of the treatment approach are sufficient to move the client forward, memory reconsolidation occurs within the PC process regardless of whether the client is focused primarily on insight, emotional processing, or some other mental activity (Greenwald, 2012). Thus, while PC works well for insight-oriented therapy clients, it is also suitable for those who are not so inclined.

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How Energy Psychology Changes Deep Emotional Learnings

David Feinstein

The stimulation of acupuncture points (acupoints) by tapping on them—used in conjunction with more conventional psychological interventions—has been shown to be effective in the treatment of a spectrum of psychological disorders (Benor, 2014). Known as "energy psychology" (Gallo, 1998), a variety of protocols have been developed, with Emotional Freedom Techniques (EFT; Craig, 2010) and Thought Field Therapy (TFT; Callahan & Callahan, 1996) being the best known and most widely practiced. Outcome investigations suggest that including the somatic elements of the approach can resolve a range of clinical symptoms with greater speed, power, and precision than psychological interventions alone (see reviews in Church, 2013; Church, Feinstein, Palmer-Hoffman, Stein, & Tranguch, 2014; Feinstein, 2012).

The Treatment Sequence

The early phases of energy psychology treatments generally parallel other therapeutic approaches in that the focus is on establishing rapport, discussing the clinical framework, and identifying the presenting problem(s). The clinician remains particularly alert for emotional, cognitive, and behavioral responses implicated in each presenting problem and the cues, contexts, or memories that trigger them.

Once a salient trigger–response pair has been identified for the initial round of tapping, typically in collaboration with the client, the amount of distress the client experiences when bringing that trigger–response pair to mind is given a 0 to 10 rating on a Subjective Units of Distress (SUD) scale (after Wolpe, 1958). An "acceptance statement" is then formulated (e.g., "Even though I have all this anger toward my father, I deeply love and accept myself"). It is repeated several times while tapping or massaging certain acupoints or other prescribed energy spots on the surface of the skin that are believed to facilitate a somatic implanting of the affirmation.

The first tapping sequence involves between 4 and 14 predetermined acupoints. The tapping is usually self-administered by the client, who firmly taps each point with the forefinger and middle finger while stating a "reminder phrase" that keeps the emotional response active. (The therapist may also shift the wording during this process to target different aspects of the problem.) After going through the tapping points, an "integration sequence" is often used which involves a variety of physical procedures, all believed to integrate left- and right-hemisphere activity while helping process the emotions activated by the treatment. This is followed by another tapping sequence using the same points as previously. The steps from the initial acceptance statement to this second tapping sequence are sometimes referred to as a "round".

After each round, another SUD rating is taken, often followed by discussion. The therapist may pose questions such as "How do you know it is still at an 8?" or "What sensations are you aware of when you bring the situation to mind?" The therapist also stays alert for internal objections to overcoming the distress (called "psychological reversals") or for pertinent aspects of the problem that have not been addressed. Any of this may shift the focus of what is targeted for mental activation during the next round. The process is repeated until the SUD rating is down to 0 or near 0. At that point, another dimension of the presenting problem may be addressed.

First-Take Skepticism

On first witnessing a demonstration of these strange-looking procedures some 15 years ago, I wondered what tapping on the skin could possibly have to do with psychotherapy and why anyone would be claiming that it is more effective than established therapies which enjoy strong empirical

support. At the time, no peer-reviewed efficacy research had been published, only passionate claims from a small number of fringe therapists who were enthusiastically promulgating the method. Watching a demonstration of the new "tapping therapy", I was surprised to be catapulted into some serious cognitive dissonance.

I had been invited as a guest to a monthly meeting of local psychologists while visiting their city. The program that evening featured a member of the group who had recently introduced energy psychology into his practice. He was going to do a demonstration of the method with a woman being treated for claustrophobia by another of the group's members. Having done research on "new psychotherapies" while at the Johns Hopkins Department of Psychiatry early in my career, I was keenly attuned to the influences on therapeutic outcomes exerted by factors such as placebo, allegiance, charisma, the contagion of a therapist's belief in a method, and the suggestive power that any clinical intervention may wield.

My skepticism only mounted as I watched the treatment unfold. While what occurred during the first few minutes was familiar and comfortable for me—taking a brief history of the problem (which had not responded to treatments from several therapists) and having the client imagine being in an elevator and giving it a rating of 10 on the 0–10 SUD scale—the next part seemed laughable. The client followed the therapist's lead in tapping on about a dozen points on the skin while saying out loud, "fear of elevators". This was followed by a brief "integration sequence" that included a set of odd physical procedures and then another round of tapping. When the client next rated being in an elevator, her SUD had diminished, from a 10 to a 7. She said her heart wasn't pounding as fast. I was surprised to see any decrease in her sense of distress. I was at the time using systematic desensitization for such cases, while this new procedure did not utilize any relaxation methods and required only two or three minutes from the first rating to the second. Perhaps the woman had developed some affection or loyalty to the therapist and didn't want to embarrass him in front of his colleagues.

Another round of the procedure brought the SUD down to a 5. After another round, however, it was back up to a 7. I was thinking, "See, just superficial fluctuations caused by the set and setting. I knew it wouldn't work!" When the therapist inquired, the woman reported that a memory had come to her of being about eight and playing with her brother and some of his friends. They had created a fort out of a cardboard appliance box. When she was in it, the boys closed the box and pushed the opening end against a wall so she was trapped in the box. They then left her there amidst laughter and jeering. She didn't know how long it was until she was found and freed, but in her mind it was a very long time, as she had been screaming till exhausted. She had not recalled this incident for years, and she rated the memory as a 10.

I thought, "Okay, so something was accomplished! A formative event has been identified that some good psychodynamic therapy will be able to resolve over a series of sessions. However strange the method, it has led to an important discovery that will give the treating therapist a new direction. It has been a useful case consultation." But that's not where it ended. The therapist doing the demonstration started having the woman tap using phrases related to the earlier experience. Within 15 minutes, she was able to recall the incident with no subjective sense of distress (SUD at 0). They then returned to elevators and quickly had that down to 0 as well. I looked on with my skepticism fighting what my eyes and ears were registering.

One of the group members suggested that it would be easy to test this, and the woman agreed to step into a hallway coat closet and shut the door. The therapist was careful to make it clear to her that she was to open the door at any point she felt even slightly uncomfortable. The door closed. We waited. And waited. And waited. After about three long minutes, the therapist knocked and asked if she was okay. She opened the door and triumphantly announced that for the first time since childhood, she was comfortable in a small enclosed space. Meanwhile, I was thinking, "Okay, I'm onto them now! This is a social psychology experiment. We are about to be informed that we have been subjects in a study of how gullible therapists can be!" That announcement never came.

Searching for an Explanation

That demonstration was persuasive enough to cause me to look further into energy psychology and then to go through a certification program in the method. I was finding that the protocol gave a tremendous boost to my clinical outcomes. The physical procedures did not resemble anything I had learned in my clinical training, but when I experimented, I found that without them the psychological procedures were not nearly as effective. As research began to accumulate that corroborated what I was observing with my own clients, and what was being reported by colleagues who were using the method, the question that became most prominent in my mind was, "Okay, if it works, how does it work?"

The first compelling clue came when I learned about an ongoing research program at Harvard Medical School. The investigators were using imaging equipment to document the physiological effects of simulating specific acupuncture points. For instance, the needling of a particular acupoint on the hand (Large Intestine 4) produced prominent decreases of fMRI-registered activation in the amygdala, hippocampus, and other brain areas associated with fear and pain (Hui et al., 2000). Subsequent studies by the same team led to the conclusion that "functional MRI and PET studies on acupuncture at commonly used acupuncture points have demonstrated significant modulatory effects on the limbic system, paralimbic, and subcortical gray structures" (Hui et al., 2005, p. 496). Further investigation provided "additional evidence in support of previous reports" that acupuncture is able to produce "extensive deactivation of the limbic-paralimbic-neocortical system" (Fang et al., 2009).

Meanwhile, a series of reports using electroencephalogram (EEG) analysis to explore neurological effects of acupoint *tapping* (as contrasted with the traditional use of needles) showed normalized brainwave patterns upon activation of a traumatic memory that had disrupted such patterns prior to treatment (Diepold & Goldstein, 2009), normalization of theta waves after claustrophobia treatments (Lambrou, Pratt, & Chevalier, 2003), and decreased right frontal cortex arousal in treating trauma following motor vehicle accidents (Swingle, Pulos, & Swingle, 2004), all corroborated by improvements on pre-/post-treatment psychological measures. Together, these laboratory findings suggest that the stimulation of specific acupuncture points, with or without needles, can bring about precise, intended outcomes—such as the deactivation of an amygdala-based fear response to a specific stimulus.

Bingo! Or so it seemed. The primary mechanism in energy psychology appeared to be that after using a reminder phrase that brings about limbic-paralimbic-neocortical arousal, tapping on acupoints sends signals to the amygdala and other brain structures that immediately reduce that arousal. This would provide a plausible explanation for the rapid effects that have been widely reported by clinicians using the method, as well as an explanation for why the interventions can be targeted to bring about precise, desired outcomes. The reminder phrase selected determines the trigger–response pairing that will then be neutralized by the signals the acupoint stimulation sends to the limbic system.

Acupuncture is able to produce "extensive deactivation of the limbic-paralimbic-neocortical system"

However, while I found this explanation to have appeal, I quickly realized it was incomplete. It did not, in fact, account for the most critical piece of the puzzle. How do a few rounds of tapping while mentally activating a problematic response *permanently* change that response? Even if the tapping does send deactivating signals to the brain structures that maintain the unwanted response, resulting in temporary relief, wouldn't tapping be needed *every time* the trigger–response pairing was activated, in order to prevent the response? Yet follow-up investigations have shown the clinical benefits of energy psychology protocols persist with no further treatment (Church, 2013; Feinstein, 2012).

Therapeutic Reconsolidation: The Missing Piece of the Puzzle

Enter the findings about memory reconsolidation that began to emerge in the late 1990s from labs around the world. Hundreds of studies have shown that "a consolidated memory can return . . . to a labile, sensitive state—in which it can be modified,

strengthened, changed or even erased!" (Nader, 2003, p. 65). Another, more powerful mechanism than *extinction* was being proposed to explain how the brain updates itself on the basis of new experience. The prevailing belief among neuroscientists had been that once a new learning is consolidated into long-term memory, it is permanently installed. It could be modified, or even eclipsed by subsequent experiences, as in extinction training, but it nonetheless remained and could be reactivated. Reconsolidation researchers were showing that if specific conditions were met after reactivation of an existing learning, that learning became labile, that is, capable of being altered or even completely erased and replaced with a new learning that integrated a current experience into the context of the original learning. The far-reaching implications of this discovery are delineated for clinicians in Ecker, Ticic, and Hulley's (2012) *Unlocking the Emotional Brain: Eliminating Symptoms at their Roots Using Memory Reconsolidation.*

The findings on memory reconsolidation show that despite the stubborn tenacity of deep emotional learnings, the brain has a mechanism for "updating existing learnings with new ones" (Ecker et al., 2012, p. 26). While core beliefs and mental models formed in the presence of intense emotion during childhood or later "are locked into the brain by extraordinarily durable synapses" that typically persist for the remainder of a person's life (p. 3), neuroscience research since 2004 has demonstrated that these core beliefs and mental models can be modified or totally eradicated. By facilitating a specific sequence of experiences, targeted emotional learnings can be activated and their synapses unlocked "for prompt dissolution of . . . retrieved learnings at their emotional and neural roots" (p. 8).

Through this process of "depotentiating" (deactivating at the synaptic level) the neural pathways maintaining implicit learnings that are at the basis of psychological problems, "major, longstanding symptoms can cease [because] their very basis no longer exists" (Ecker et al., 2012, p. 4). Whether in the lab, the consulting room, or the daily flow of life experiences, the deeply embedded learnings that "underlie and generate" (p. 14) a large proportion of the symptoms presenting in psychotherapy can be revised or altogether eradicated when a set of precise conditions has been met. Called the "transformation sequence" (p. 41), three interrelated experiences must occur:

1. The emotional memory or learning must be vividly accessed.
2. A "juxtaposition experience" that contradicts the implicit models or conclusions drawn from the original experience must concurrently be activated.
3. The juxtaposition pairing must be repeated several times.

Studies in labs and clinical settings, using both animal and human subjects, all point to this simple, commonsense sequence of steps as the way new experiences are incorporated into established models of how the world works and one's place in it. These steps seem to be nature's key for chemically unlocking the synapses that maintain deep learnings established in the past during highly charged emotional experiences, and for allowing them to be reconsolidated in a new way based on more recent experiences.

The findings on memory reconsolidation show that despite the stubborn tenacity of deep emotional learnings, the brain has a mechanism for "updating existing learnings with new ones"

While not all psychotherapy facilitates this transformational sequence, Ecker et al. (2012) maintain that if the therapy produced basic markers of permanent change of an acquired response, these steps must have occurred "whether or not the therapist or client was cognizant of this sequence of experiences taking place" (p. 127). They maintain, in fact, that this model is a "meta-conceptualization" (p. 129) that transcends the theories and techniques of specific schools of psychotherapy, and that it can be applied to the implicit learnings that are at the foundation of a wide range of psychological symptoms, whether "formed in attachment, existential, social, traumatic, or other experiences" (p. 126).

How Energy Psychology Protocols Utilize Reconsolidation

In introducing the earliest acupoint tapping protocols, Callahan (1985) formulated a set of procedures that were, by intuition or by accident, remarkably attuned to the findings on memory reconsolidation that would emerge two decades later. Each of the steps in the transformation sequence identified by Ecker et al. (2012) occurs by following the core procedures of an energy psychology protocol. Even without the therapist or the client thinking in terms such as "juxtaposition experiences", "disconfirming knowledge", or "reconsolidation", the steps of the transformation sequence nonetheless occur.

Step 1: The emotional memory or learning must be vividly accessed. In a typical energy psychology treatment, the initial rounds of acupoint tapping most often involve activating the symptom or presenting problem using images, evocative phrases, or a felt sense of the problem. That scenario inevitably contains the implicit learnings underlying the symptoms. For instance, when the woman discussed above brought to mind being in a closed space by means of imagery and the reminder phrase "fear of elevators", the implicit belief that closed spaces are dangerous and to be avoided was activated. The formative experiences that established such a learning do not necessarily need to be accessed, but they frequently emerge. When the tapping has removed some of the emotional edge of the current problem, childhood memories involved with the presenting problem tend to spontaneously enter the client's awareness. When this happens, they generally become an area of focus, as occurred when the memory of being trapped in the appliance box came into the woman's mind. This allows the adaptive historical function of the symptom to be recognized and appreciated, a process that Ecker et al. (2012) use to normalize and humanize the client's symptoms and treatment. If, as is often the case, it proves necessary to address the original formative experiences to completely resolve the presenting problem, and the relevant memories do not arise spontaneously, techniques for bridging to earlier memories, such as following a current feeling or bodily sensation back to one of the first times it was experienced, are frequently used.

Step 2: A "juxtaposition experience" that contradicts the implicit models or conclusions drawn from the original experience must concurrently be activated. The second step in the sequence—generating an experience that disconfirms the earlier learning—is the most complex stage for most reconsolidation-oriented therapies, but it is where energy psychology protocols are shown to greatest advantage. Because stimulating selected acupoints rapidly reduces limbic arousal (Fang et al., 2009; Hui et al., 2000, 2005), the emotional landscape changes *during* the exposure. A traumatic memory or trigger that produced a physiological threat response is vividly imagined, but the disturbing physiological response is no longer present. The brain is already experiencing a mismatch from learned expectations. The memory or trigger created a strong expectation that an unpleasant emotional reaction would be evoked, but the expected response did not occur, because acupoint stimulation had temporarily deactivated the limbic response. As the woman imagined being in an elevator without feeling the expected fear and racing heart, a mismatch occurred between her experience and her expectation. This juxtaposition of holding the troubling scene simultaneous with no physiological arousal is the mismatch that unlocks the neural pathway maintaining the old learning so it can be transformed by the new experi-

The memory or trigger created a strong expectation that an unpleasant emotional reaction would be evoked, but the expected response did not occur, because acupoint stimulation had temporarily deactivated the limbic response.

ences in the next step. The mismatch or "disconfirming experience" in energy psychology treatments is generated simply by tapping on the skin—almost too easy to believe. The required mismatch is effected by bringing the trigger to mind while preventing the expected threat response from occurring via the deactivating signals the acupoint stimulation sends to the limbic system. Other therapies usually have to work much harder to create suitable mismatch experiences.

Step 3: The juxtaposition pairing must be repeated. Energy psychology protocols involve substantial repetition. Not only are as many rounds as necessary carried out to bring the SUD rating down to 0 or near 0 (in some cases having some subjective distress is considered adaptive), but every aspect of the problem that can be identified as evoking subjective distress is treated. In addition, therapists learning energy psychology are taught to challenge their positive outcomes. They might ask the client to try to reproduce the fear, pain, anger, or other disturbing emotion associated with the target memory or trigger by making the imagery more vivid or simply willing the earlier emotion to return. They might test the results by having the client imagine contexts that are even more severe than the original tapping scene and more likely to trigger distress. Back-home or other in vivo tests are also encouraged and discussed.

a) identifying the target symptom, b) identifying the implicit learnings that maintain the symptom, and c) identifying knowledge within the client's experiences and beliefs that contradicts the learnings that maintain the symptom. Then, to *verify* that the transformation sequence has been successful, Ecker et al. turn to the same markers that neuroscientists use in laboratory studies to determine whether an emotional learning has been permanently eradicated via reconsolidation: the change was abrupt rather than incremental, the symptom-generating emotional reactions that had been triggered by specific cues and contexts are absent, and the change persists "without effort or counteractive measures" (p. 127). In what follows I will explore how these additional phases of treatment played into a case study.

Energy Psychology and Reconsolidation: A Case Study

In selecting a case to review in terms of the therapeutic reconsolidation model, I simply chose my most recent published case (Eden & Feinstein, 2014, pp. 221–224). As part of a book for the general public, it was not written to illustrate the reconsolidation process, and I thought it would be an interesting experiment to see how readily it fitted with the Ecker et al. (2012) model. I have structured the commentary so you can judge the results of this experiment for yourself. The descriptions of the case and

The required mismatch is effected by bringing the trigger to mind while preventing the expected threat response from occurring via the deactivating signals the acupoint stimulation sends to the limbic system.

The Preliminary and Verification Phase

For clinicians to purposefully bring about what is termed "the therapeutic reconsolidation process" (p. 126), Ecker et al. (2012) describe a set of preliminary steps that are generally necessary to set up the transformation sequence outlined above and also a verification process that follows the transformation sequence. The three *preliminary* steps include

the treatment are taken from the published version, edited and abridged only slightly to fit this context. The comments bridging it to the conditions necessary for therapeutic reconsolidation are new and are in italics.

Background. Jeremy was 36 when he married Melissa. He was eager to help raise her sons, aged 7 and 9. He had gotten to know them quite well dur-

ing the year prior to the marriage, had taken them to baseball games, zoos, parks, and other local attractions, and had participated in their hobbies. The boys liked their stepdad and the attention he was giving them, and the new family was blossoming within an atmosphere of affection and promise. Melissa's ex-husband, Steve, the boys' biological father, had not been particularly eager to spend time with his sons during the marriage, but he also loved them. He had moved to another town several hours away after the divorce but had been reliable in taking the boys for the afternoon every other Sunday.

During his courtship with Melissa, Jeremy had never met Steve. But now that Jeremy had moved in with the family, the twice-monthly visits became a fixture in his life. He was civil enough toward his new wife's ex, but he avoided having much contact with him when the boys were being picked up or dropped off. During the first Christmas vacation after the marriage, Steve arranged to take the boys for a week, and the three of them flew to Orlando for a Disney marathon. The boys were so excited about it that they seemed to talk of little else for the week prior to and for the week following the trip. When Steve came for the next Sunday visitation, Jeremy could hardly look at him. He began to criticize Steve's parenting style to Melissa, point out his culpability in the divorce, and generally paint an ugly picture of the man who had fathered her children. At first Melissa acknowledged the truth in some of the observations, but over time Jeremy became increasingly vehement in his criticisms. This grew into a loaded theme in their interactions on the weekends that Steve would be arriving, and Jeremy began questioning the boys about their visits with their father, as if looking for more fodder for his rants. He was eventually unable to hide from the boys his disdain toward their father.

Jeremy's jealousy toward Steve continued to escalate, and the acrimony was seeping into other areas of the family. As Steve's visits approached, tension would descend onto the household. The boys were confused. Melissa began to judge Jeremy harshly. She had more than once called him a "spoiled brat". This was the state of things when they scheduled a couple counseling session with me.

Preliminary phase. Jeremy knew at some level that his reactions were not rational, but this knowledge was no match for the strength of his emotions. When Jeremy was triggered, Steve was an evil man sabotaging all of Jeremy's fine efforts with the boys and the family, and there was no other reality to consider.

After hearing both of their renditions of the problem, I spoke to the part of Jeremy that knew his reactions to Steve were extreme. I explained that when intense emotions are triggered, they are very real, whether rational or irrational. I suggested tapping to take the edge off the intensity of Jeremy's responses to Steve. Neither Jeremy nor Melissa had any experience with energy psychology, but the couple who referred them had worked with me and described the method, so they were game for anything that could help, however strange it might seem. While Jeremy was not open to considering that his assessment of Steve might be wrong, he was interested in feeling less consumed by his reactions. *We had accomplished only the first of the three preliminary steps—"identifying the target symptom"—before the first round of tapping. Jeremy knew his reactions to Steve were extreme and that was what he wished to change. As you will see, the next preliminary step, "identifying the implicit learnings that maintain the symptom", occurs during the tapping protocol.*

First round of tapping. The scene that Jeremy chose for the first SUD rating was from the previous Sunday, watching as Steve's car pulled into the driveway. He gave it a 10. *So we have activated the emotional reaction, but not yet completed the first step of the transformation process by identifying the emotional learning—the implicit meanings or models—that are driving the reaction.*

After four rounds of tapping, the SUD had gone down to a 7, but even after further tapping it seemed to be stuck there. I asked, "How do you know it is a 7?" Jeremy said that he felt pressure in his chest and a tightness in his throat. I asked him to explore the feelings in his throat. He said it was almost as if he were trying to hold back tears. I asked if he could remember one of the first times he had that feeling. He immediately recalled being 10 when his parents brought a foster boy into the family. It was to be a temporary arrangement until a permanent placement could be found, a favor for a relative of the boy, but it changed everything for Jeremy.

As an only child, Jeremy had enjoyed his parents' full attention and affection. Suddenly, that was his-

tory. The foster boy had many problems, both of Jeremy's parents held full-time jobs, and the limited time and resources they had available shifted from Jeremy to the new boy. Jeremy, at 10, did not have words or concepts that could help him come to grips with the loss. He felt emotionally abandoned by both of his parents, could not fathom why they had brought this troublesome person into their home, and he hated the foster boy. He began starting fights and creating acrimony wherever he could. This strategy seemed to eventually work. After about a year, the agency found a permanent placement for the boy and Jeremy never saw him again. All of this had faded from Jeremy's awareness. He hadn't thought about it for years, and no other circumstance in his adult life had triggered his unprocessed feelings around that phase of his childhood. He had never thought to mention it to Melissa, but the parallels between the foster boy and the situation with Steve became immediately obvious to all three of us.

This insight and its subsequent exploration accomplished the second preliminary step, "identifying the implicit learnings that maintain the symptom", as well as completing the first step of the transformation process, "vividly accessing the emotional learning". Jeremy now recognized that he was projecting onto Steve the model he had formed during his experience with the foster boy, admitting that he was afraid Steve was going to render him peripheral and alone, just as the foster boy had done. Notice that we are not going in the exact order of completing the preliminaries before starting the transformation process, nor do Ecker et al. (2012) imply that the steps are fixed. In fact, as you move into the transformation phase, additional information that corresponds with the preliminary topics for exploration organically emerges and may subsequently be utilized.

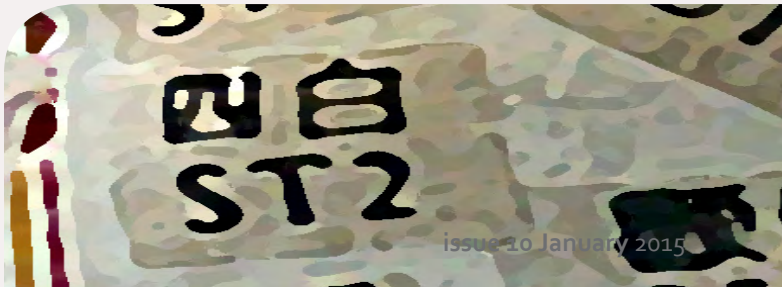
Neutralizing salient aspects of the problem. We tapped on every aspect of the memory we could identify, staying with each until subjective distress was down to a 0: Jeremy's loss of his parents' attention; his many times having held back tears when he felt lonely and abandoned; his confusion and puzzlement about what he had done wrong to deserve having all the attention withdrawn from him; the invasion into his family; his hatred for the new boy; the fights they had; his being punished for starting them and feeling like a bad boy after 10 years of being a good boy; and even his confusion when the new boy suddenly disappeared.

Fortunately, each round of tapping takes only a couple of minutes, so all of this was accomplished within that first session (I generally schedule two hours for initial sessions with couples). Jeremy was by then able to talk lucidly and calmly about the foster boy and the boy's invasion into his young life. *We now see Jeremy vividly having an initial set of juxtaposition experiences, the second step of the transformation process. His memories about the foster boy are no longer paired with feelings of anger, hate, jealousy, and abandonment. This was accomplished simply by evoking the memories and neutralizing the emotional responses using the acupoint tapping.*

Completing the transformation sequence. Now Jeremy could reflect on how Steve's visits with the boys were bringing up feelings that could be traced back to his experiences with the foster boy. *Finally, we get to the third preliminary, "identifying knowledge within the client's experiences and beliefs that contradicts the learnings that maintain the symptom". Jeremy was recognizing that his sense of Steve purposefully trying to destroy Jeremy's family seemed to have more to do with this earlier scenario than with the current one. He was now able to simultaneously hold two possibilities: the still somewhat emotionally charged framing from the old learning that "Steve is trying to destroy my family and upset my place in it", and the emotionally benign framing from the new learning that "Steve is just visiting with his boys like any father gets to do, and even though it sure reminds me of what I went through at 10, he really isn't a threat to my relationship with the boys".*

Focusing again on watching Steve's car pulling into the driveway, Jeremy gave it an SUD rating of three. A couple more rounds of tapping and it was down to a 0. *We have by now created juxtaposition experiences (the second step of the transformation process) enough times and in enough contexts (first with the foster boy and then with Steve) to accomplish the third step, which is the repetition of the juxtaposition experiences. The conditions have been met for Jeremy to permanently revise, through the therapeutic reconsolidation process, the deep emotional learnings from his childhood that were driving his reactions to Steve.*

Addressing fallout. We then briefly focused on Melissa's horror and sense of betrayal about Jeremy's shift over the recent months from an appar-



ently ideal stepfather to an angry, jealous, irrational force in her home. Witnessing what we had gone through with Jeremy had already put all of this into a welcome new light, and by the end of the session, Melissa was able to review the strange course of their young marriage with no emotional charge.

Follow-up. On a follow-up session two weeks later, the issue had vanished. Jeremy was not triggered by Steve's next visit, the strong relationship Jeremy had established with the boys and with Melissa was back on track, and I had lost customers who could easily have spent a year or two in counseling. Such are the risks a therapist takes when diving right into the therapeutic reconsolidation process. *The verification phase of the treatment was accomplished in that the three markers of an emotional learning having been permanently eradicated were all present: the change was abrupt rather than incremental, the symptom-generating emotional reactions that had been triggered by specific cues and contexts were absent, and the change persisted without effort or counteractive measures.*

Discussion

The observations of Ecker et al. (2012) regarding therapeutic change, based on an understanding of the reconsolidation of emotional learnings, are consistent with the clinical reports emerging from energy psychology. One of the most controversial yet significant of these is that "transformational change through the erasure sequence does not rely on extensive repetition over time to effect change" (p. 32). The rapid outcomes seen in energy psychology treatments are consistent with Ecker et al.'s observations about "the swiftness with which deep, decisive, lasting change occurs through the therapeutic reconsolidation process" (p. 32). This, of course, "challenges traditional notions of the time required for major therapeutic effects to come about" (p. 32).

Another pertinent observation is that the "mismatch" component—the visceral experience that contradicts the client's existing emotional knowledge and becomes the basis for the new learning—"must feel decisively *real* to the person based on his or her own living experience . . . it must be experiential learning as distinct from conceptual, intellectual learning, though it may be accompanied by the latter" (p. 27). One of the most satisfying and frequently repeated experiences for energy psychology practitioners is watching the astonished expression on a person's face when bringing to mind a memory or trigger, or entering an in vivo situation, that 15 minutes earlier was met with the physiological components of terror but is now devoid of any emotional charge whatsoever.

The change was abrupt rather than incremental, the symptom-generating emotional reactions that had been triggered by specific cues and contexts were absent, and the change persisted without effort or counteractive measures.

Of particular interest with reconsolidation-informed therapies is the way that when an old emotional learning is erased, "erasure is limited to precisely the reactivated target learning, without impairing other closely linked emotional learnings that have not been directly reactivated" (Ecker et al., 2012, p. 25). Consistent with reports from energy psychology practitioners, after the learned fear response has been eliminated, "subjects still remembered the experiences in which they had acquired the conditioned fear response, as well as the fact of having had the fear, but the fear was not re-evoked by remembering those experiences" (p. 25). Ecker et al.'s (2012) observation is also clinically instructive. Energy psychology protocols treat every aspect of a problem that can be identified. It is not assumed that closely linked emotional learnings have been neutralized until they have each been addressed. For instance, a psychological aspect of the fear of elevators experienced by the woman from my earlier example was her childhood experience of being trapped in the appliance box. Both the current fear and the formative memory needed to be treated before it was likely that her phobia could be fully eliminated.

One final observation from Ecker et al. (2012)—that the treatment leads to an "increased sense of unified self and wholeness" (p. 33)—is also consistent with the outcomes reported by energy psychology practitioners. Not only are symptoms overcome, but when outdated emotional learnings are submitted to the therapeutic reconsolidation process, and old limiting beliefs and mental models transformed, new connections with neural networks that support optimal functioning are formed. Implicit memories and learnings enter the neocortex-mediated explicit memory system and integrate with neural pathways that support more adaptive coping strategies and an enhanced sense of integration. With little prompting, clients talk about themselves and their situation in more self-affirming ways. Their view of their world and their place in it becomes more complex yet more coherent and empowering.

Energy psychology protocols thus explicitly and organically fulfill the steps necessary for the therapeutic reconsolidation process. The tapping in itself does not erase or transform the embedded learning. But it does temporarily deactivate the limbic response to the memory, cue, or context that was evoking the target emotion and related learning. When the circumstances that triggered the emotion are experienced without the expected emotion occurring, the contradictory experience that is necessary for juxtaposition and therapeutic reconsolidation is unwittingly but fortuitously created. The outdated learning or model is then permanently eliminated or updated through the reconsolidation process. The client's felt sense is that a memory, cue, or context that had evoked a strong and unwanted emotional or behavioral reaction no longer triggers that reaction. The change is brought about rapidly, with precision, and it is lasting.

* * *

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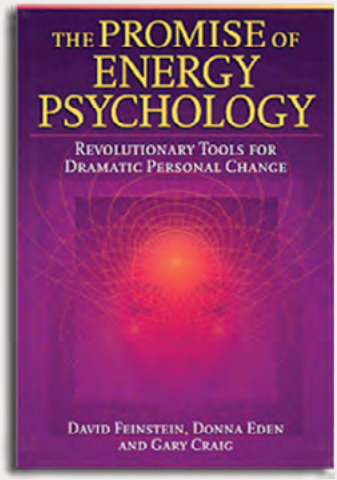

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Using NLP for Memory Reconsolidation

A Glimpse of Integrating the Panoply of Psychotherapies

Bruce Ecker

Memory reconsolidation is the brain's innate process for unlocking stored learnings and conditionings at the synaptic level. Unlocking is of course a metaphorical term, but in this case the metaphor describes the very real cellular and molecular destabilization of encoding synapses. (For research reviews, see Agren, 2014 and Reichelt & Lee, 2013.)

That destabilization is the deconsolidation of the target learning, and it launches a process of reconsolidation or restabilization, which is completed in about five hours. During this period (known as the reconsolidation window), the target learning is susceptible to being unlearned and erased along with the unwanted responses that it generates (both external behaviors and internal states of mind), without any loss of personal autobiographical memory.

To the best of our scientific knowledge, reconsolidation is the core process in play whenever lasting, transformational change occurs in psychotherapy. There is no other known type of neuroplasticity that can eliminate a learned, well-established response pattern. The process of extinction temporarily suppresses but does not erase a target learning (Bouton, 2004), and is a fundamentally different neurological process than reconsolidation (as reviewed by Ecker, 2015).

The brain's requirements for triggering the reconsolidation and erasure of a specific target learning are well defined, as described below, but the brain does not care what particular techniques or procedures are used for fulfilling those requirements. That is why many different forms of psychotherapy (as well as experiences in other contexts) sometimes succeed in facilitating transformational change, even when the therapist is not informed about memory reconsolidation and is unaware of fulfilling its requirements.

Through acquiring such awareness, a clinician's ability to reliably and consistently facilitate transformational change can increase significantly. I experienced this myself and have seen it prove true for many clinical colleagues. For the psychotherapy field it is significant that empirical knowledge of how reconsolidation produces lasting change represents a major, unprecedented alternative to the multiplicity of theory-based models of change that have shaped the clinical landscape for over a century.

The therapeutic reconsolidation process

For flexible, consistent utilization of memory reconsolidation in psychotherapy, there is a general template that translates the laboratory findings into clinical application, consisting of a series of steps known as the *therapeutic reconsolidation process* (Ecker, Ticic, & Hulley (2012, 2013a). That process is fully natural and uses new learning to erase old learning. Chemical methods of erasure have also been studied (see Agren, 2014) but are in general less effective, less versatile, and less safe.

The case example below identifies how the steps of the therapeutic reconsolidation process, or TRP, are carried out by one of the core techniques of the neuro-linguistic programming (NLP) system of psychotherapy (Dilts, Grinder, Bandler, & DeLozier, 1980; Wake, 2008). The TRP begins with three preparatory steps of *accessing needed material*:

A. Identify symptom. Clarify with the client *what* to regard as the presenting symptom(s)—the specific behaviors, somatics, emotions, and/or thoughts that the client wants to eliminate—and *when* they happen, that is, the cues and contexts that evoke them. This information is critical to carrying out Step B.

B. Retrieve target learning. Bring into explicit awareness, as a visceral emotional experience, the details of the emotional learning or schema underlying and driving the presenting symptom. Knowledge of this material is critical to carrying out Step C.

C. Identify disconfirming knowledge. Find a vivid experience (past or present) that can serve as living knowledge that fundamentally contradicts the model of reality in the target emotional learning, such that both cannot possibly be true. The disconfirming material may be already part of the client's personal knowledge or may be created by a new experience.

As a result of Steps A, B, and C, client and therapist now have ready access to the materials needed for the three next steps, the *erasure sequence*, that yield a transformational change:

1. Reactivate target learning. Cues or contexts known to retrigger the target learning are used to reactivate it into foreground awareness. This is a

bodily experience of emotional arousal combined with cognitive recognition of the content of the target learning.

2. Guide juxtaposition. With reactivation occurring, guide an experience that contradicts and disconfirms the target learning's model and expectations of how the world functions. This *juxtaposition* of the target learning with a vivid disconfirmation fulfills the requirement for *memory mismatch* or *prediction error* identified in many empirical studies of reconsolidation (e.g., Pedreira, Pérez-Cuesta, & Maldonado, 2004; Sevenster, Beckers, & Kindt, 2013; for an extensive list, see Ecker, 2015 or http://tiny.cc/7yutfx). The juxtaposition immediately destabilizes and unlocks synapses, rendering neural circuits susceptible to being updated by the disconfirming experience as new learning.

3. Nullify and erase via new learning. Guide a few repetitions of the juxtaposition in Step 2.

The next and final Step V seeks *verification of transformational change* by observing its three clear markers (the same markers that neuroscientists regard as confirming erasure of a target learning):

V. i. Symptom cessation. Unwanted behavior, emotion, somatics, or thoughts permanently cease to occur.

ii. Non-reactivation. The specific emotionally activated state and schema underlying symptoms can no longer be reactivated by cues and triggers that formerly did so.

iii. Effortless permanence. Non-recurrence of the emotional reaction and symptoms continues without counteractive or preventative measures of any kind.

The therapeutic reconsolidation process or TRP consists of those seven steps, A-B-C-1-2-3-V. The case example below adds NLP to the growing list of therapy systems that have been shown to carry out the TRP. As more and more therapy systems are added to that list, the validity of the TRP as a comprehensive framework of psychotherapy integration is demonstrated more extensively. For an updated list of psychotherapy systems that have been shown to guide the steps of the TRP, see http://bit.ly/15ZooHQ.

My further aim in the following case example is to show that, in addition to serving as a guide for consistently effective psychotherapy, the TRP is truly useful as a framework of psychotherapy integration. The TRP positions a therapist to see the multiplicity of therapy systems as a huge repertoire of ways of facilitating the same core process of transformational change. I hope to give readers a vicarious glimpse of the expanded capability and clinical dexterity that are gained by having the TRP as one's home base.

NLP Case Example

The client is a 45-year-old man whom I'll call Thomas. He described long-term PTSD in the form of a terrifying image and body sensation that were retriggered fairly often whenever he thought about clearing out "a whole room in our house piled *full* of books, papers, and unopened mail". He said he had created that accumulation and added, "This room has been a source of contention in my marriage for years."

Thomas was always stopped from putting this room in order because the thought of approaching that task triggered an overwhelming fear that he described by saying, "I feel I'm seeing a tidal wave coming right at me." He meant that literally, and the experience was quite destabilizing emotionally. Even describing this room situation to me was a delicate matter for Thomas, requiring pauses so that he could breathe and calm himself. It was clear to me that Thomas was describing PTSD symptoms, that is, the retriggering of traumatic memory. However, he had no idea at all about any original traumatic experience that had set up this horrible image and feeling of an oncoming tidal wave.

As I listened to Thomas describe this problem, I was considering his account in relation to the steps of the TRP, because the TRP is the framework I use for psychotherapy. I saw that Step A, symptom identification, was adequately accomplished, so I was wondering about Step B, eliciting explicit recognition of the emotional learning producing the symptom. I realized that Thomas had already revealed to me a key piece of that emotional learning: his emotional brain had evidently learned that approaching the piled-up room for clean-up work meant a tidal wave was coming right at him. That strong association between cleaning up the piled-up room and the horror of facing a tidal wave was the target learning in need of unlearning and dissolution by means of the therapeutic reconsolidation process. I was re-

minded of classical conditioning, in which the emotional brain learns to associate a normally harmless perception with a specific form of suffering.

Now that I had taken stock of the target learning responsible for Thomas's traumatic reactivation, Step B was carried out, and it was time for me to begin Step C, finding how Thomas could have an experience that decisively disconfirms the target learning. Usually I use the methods of Coherence Therapy to carry out the TRP, and for Step C in particular, Coherence Therapy provides an assortment of methods (Ecker et al., 2012). In this case, however, as I wondered how best to find an experience that would potently contradict the Pavlovian-like association of room and tidal wave, it was a method from NLP, not Coherence Therapy, that came to mind.

I proceeded immediately to guide the NLP technique, yet I did not feel I was switching out of one framework and into some other, different framework of psychotherapy. I was not thinking, "I need to switch over to NLP for this." I was staying in the core process of my home framework, the TRP. I knew what needed to be done next according to that process (Step C) and was scanning the various therapeutic methods in my personal repertoire for those that fit the client's material for that next step. In doing so, my internal process felt natural and seamless, and it was also very satisfying to have such a unifying framework guiding me to deliver an effective process of change. Otherwise, the extreme fragmentation of the psychotherapy field can feel anything but seamless as we strive to help our clients.

The NLP technique that I began guiding was very simple—so simple that there is far more involved in describing why it worked than how it was carried out. Bear in mind that my aim at this point was finding how to *create an experience* that would contradict and disconfirm Thomas's existing emotional learning that trying to clear out the piled-up room meant a tidal wave was coming at him. I was wondering how to create that experience when the NLP device of visualizing images on video screens came to mind. I began guiding Thomas to visualize two video screens at a moderate distance from him, so that they appeared smallish, with a sizable separation between them.

I said, "On one of the small screens is the image of the messy room. Do you have that? Good. On the other screen is the image of the scary tidal wave. Just see those images on those two screens. Is that workable?"

Yes, it was workable. For about ten seconds Thomas was silent as he internally attended to the imagery. I had no idea whether this approach would prove effective for him. Perhaps I would have to try some other way of fulfilling Step C. What Thomas said next, however, revealed that the visualization had the intended effect. He said, "Oh! I don't feel it anymore. It just now became really clear all of a sudden that the messy room is just a messy room, not a tidal wave. It doesn't feel overwhelming now."

The linkage of room and tidal wave had dissolved, and it never came back. The grueling reactivation disappeared and did not recur. In some cases, Step C, which completes the preparatory accessing sequence of the TRP, in turn precipitates Steps 1-2-3 of the erasure sequence, and that is what happened for Thomas, though I was not expecting this.

Two weeks later, he emailed to report that he had gone into the room many times and had not felt overwhelmed, and that having just completed a big project, he was now thinking about what to do with his available time, and "One of the first things that popped into my mind was to spend time cleaning out that messy room, which I felt very positively motivated to do and plan to tackle over the weekend." Three months after that email he sent me a handwritten thank-you card in which he wrote: "Steadily, I've been working on that room for hours at a time. It's not done yet. I'm about three quarters of the way through. It's not a matter of *if* I'm going to finish cleaning it up, it's a matter of *when!* My wife is dumbfounded by this change in behavior. ...And needless to say, she's overjoyed!"

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Looking Closely at the Process of Change

Thus, about one minute of guiding a simple visualization of two video screens produced a transformational change that freed this man from a potent trauma reactivation that had tormented him and ruled his behavior for many years. His follow-up reports fulfilled final TRP step V, the verification of

markers of lasting change, but we also need to look closely at how and why the video screen visualization so effectively fulfilled TRP Steps C-1-2-3.

In other words, how did that visualization create the decisive disconfirmation experience that Thomas described when he said, "It just now became really clear all of a sudden that the messy room is just a messy room, not a tidal wave"? And how did that experience juxtapose with the target learning, as is necessary for profound unlearning to occur? Given that Thomas's familiar discomfort had so easily been retriggered merely by telling me about the room or the tidal wave, why wasn't it simply retriggered yet again by seeing the images of those two things on video screens in his mind's eye?

Here is my understanding of the effectiveness of the visualization (as well as many other specific techniques of NLP). The target learning had been powerfully maintaining Thomas's experience of a tidal wave coming whenever he approached the room to de-clutter it, but that learned version of reality was just one small bit of reality-defining material within his vast mind. Normally, his conscious awareness focused on that room-brings-tidal-wave schema only when the schema had been reactivated, and under those conditions of reactivation, his conscious awareness was merged into the schema, inhabiting and subjectively feeling the apparent reality that the schema compellingly created.

By encountering the components of the schema on video screens at a distance from himself and from each other, for the first time Thomas's conscious awareness was viewing from a position outside of the schema while attending to the contents of the schema. That "dissociation", as it is termed in NLP, is the critical effect of the video screen as a visualization device. A video or movie screen, as a visual format, cues the emotional brain into the context of, "I am outside of what I am seeing on the screen, and what is on that screen is not now actually happening to me."

Therefore as Thomas was seeing the images on the screens, his emotional state was not being governed by the target schema "room brings tidal wave", even though that schema was activated in the sense that its main features were overtly expressed. Viewing from that shifted vantage point outside of the schema, his consciousness was now free to recognize what the two separate screens were plainly showing him: that the room and the tidal wave were two separate, unrelated things. His mind was perfectly capable of recognizing and knowing that separateness, but not while his consciousness was inhabiting and merged with a schema in which room and tidal wave *were* tightly linked.

It is of course adaptive and survival-positive overall that learned, urgent emotional schemas normally dominate conscious experience and do not allow other contexts or versions of reality to register. Yet that dominance keeps many people stuck in endlessly re-experiencing the worst experiences of their lives, as Thomas was. The founders of NLP understood that non-problematic schemas or contexts can be cued into activation and inhabited as the locus of conscious awareness just as problematic schemas are. Many NLP techniques utilize ingenious ways of cueing a context that positions conscious awareness outside of the schema maintaining the problem. Working in the 1970s, the NLP founders did not know about memory reconsolidation, but they saw that skillful cueing of contexts was an effective way to create experiences that disconfirm and dissolve symptom-generating schemas. Knowledge of reconsolidation now deeply illuminates for us how and why such techniques can be so effective.

NLP founders did not know about memory reconsolidation, but they saw that skillful cueing of contexts was an effective way to create experiences that disconfirm and dissolve symptom-generating schemas.

As mentioned, guiding Thomas through the visualization was much simpler than explaining why it worked. By beholding the room and the tidal wave from outside of the schema that linked them tightly together, Thomas in his wider mind effortlessly underwent the disconfirming experience that I was searching for. It was not merely a cognitive or factual insight that the room and tidal wave were unrelated things; it was an experiential knowing that had the quality of unmistakable, felt realness. That is the quality required in order for the erasure sequence, Steps 1-2-3, to be successful next.

Step 1, the reactivation of the target learning in the foreground of explicit awareness, was already in effect and had been from the start of Thomas's therapy session. Thomas was all too aware of the tight connection he felt between going toward that room

to work on clearing it and seeing a tidal wave bearing down on him and terrifying him. That is why, as soon as the contradictory experience became apparent to him while visualizing the two video screens, he immediately experienced a juxtaposition of the target learning and the contradictory knowing, fulfilling Step 2. His learned emotional knowledge that approaching the room brought on the tidal wave collided with his now lucid knowledge that "the messy room is just a messy room, not a tidal wave".

Step 3 consists in a few repetitions of that juxtaposition. As a rule, this happens quickly in the client's internal process directly after the first juxtaposition in Step 2, as the client's attention flicks repeatedly back and forth between the two incompatible knowings in surprise and amazement. Even so, my standard practice with clients is to guide them explicitly through about three repetitions of the juxtaposition, to be certain that the two-sided experience is well formed and sustained, carrying out the unlearning process as fully as possible. Thomas, however, instantly gave such a decisive indication of unlearning and erasure of the target learning that I saw no need for overt repetitions.

Usually the first sign of successful erasure is the client's indication, following the juxtaposition experiences in Steps 2 and 3, that the target learning suddenly no longer has the feeling of emotional realness and is not reactivated even when thinking of or experiencing circumstances that have consistently retriggered it in the past. (For a description of the variety of clients' prompt responses that signal dissolution of target learning, see Ecker et al., 2012, p. 60.) Subsequently, the most conclusive marker of erasure is permanent non-reactivation in all actual situations that formerly were triggers, with no effort required to avoid reactivation.

Conclusion

The case examined here illustrates that for carrying out the therapeutic reconsolidation process, it can be sufficient to make explicit the emotional learning underlying the symptom without identifying the original experiences in which that emotional learning was formed. Knowledge of the latter is usually very helpful if accessible, but it is not necessary.

In most cases, the emotional learning maintaining the client's problem or symptom is significantly more complex than the relatively simple associative linkage described here. For a wide range of TRP case examples with more complex material, see Ecker et al. (2012, 2013a,b). Applying the TRP in such cases can be a non-linear, multi-faceted process requiring many sessions, but the core steps of process are still as described above.

As noted, attending to an emotional schema from an unmerged position outside the schema is termed "dissociation" in NLP. To avoid possible confusion, I should point out that this word is typically used with a different sense by therapists. In the therapeutic context, "dissociation" tends to denote a disconnection from emotionally problematic material such that it is suppressed out of awareness, whereas in NLP, "dissociation" describes a state of being aware of such material while yet experiencing differentiation from it and remaining unmerged with it. The two-screen technique I used with Thomas is a relatively simple form of NLP-type dissociation process, indeed much simpler than the "visual-kinesthetic dissociation" technique that is well known among NLP practitioners (Dietrich, 2000; Gray & Liotta, 2012; Hossack & Bentall, 1996; Koziey & McLeod, 1987).

The state of unmerged attending to significant problematic material allows contradictory knowledge to be accessed and brought into juxtaposition with that material. This juxtaposition experience is the crucial ingredient that triggers reconsolidation, destabilizing the synaptic encoding of the problematic learning and allowing profound unlearning and transformational change, as we have seen.

I believe that what I have been calling the unmerged attending type of dissociation is a key ingredient not only in NLP but also in several other forms of therapy, including EMDR, tapping, and progressive counting, and may be largely or wholly responsible for their effectiveness. The methodologies of EMDR, tapping, and progressive counting utilize a "dual focus" procedure in which conscious awareness is anchored to a sensory stimulus in the safe present environment while also attending internally to the traumatic emotional learning underlying the symptom (see, e.g., Lee, Taylor, & Drummond, 2006). In that way, conscious awareness is anchored outside of the target emotional learning while attending to it, as in NLP's dissociation techniques. The conjectures I have made here will of course need to be substantiated by suitably designed controlled studies.

I hope to have provided in this article a sense of how the therapeutic reconsolidation process can serve as a framework that integrates and guides our use of the kaleidoscopic pantheon of available

forms of psychotherapy. There are so many inventive, artful and soulful methods to draw upon for guiding transformational change through the brain's innate process of memory reconsolidation.

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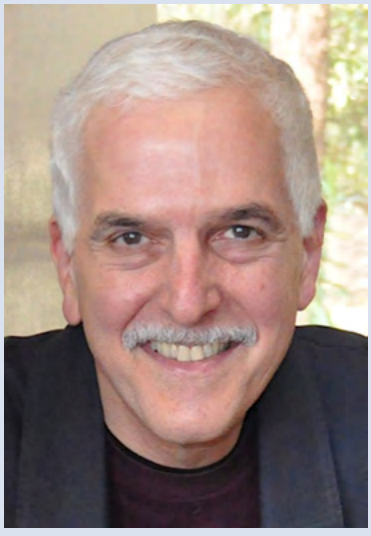

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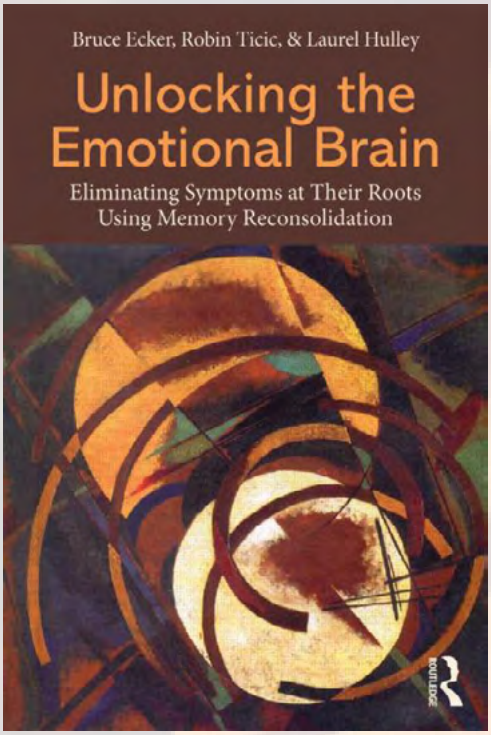

Psychotherapy that regularly yields liberating, lasting change was, in the last century, a futuristic vision, but it has now become reality, thanks to a convergence of remarkable advances in clinical knowledge and brain science. In Unlocking the Emotional Brain, authors Ecker, Ticic and Hulley equip readers to carry out focused, empathic therapy using the process found by researchers to induce memory reconsolidation, the recently discovered and only known process for actually unlocking emotional memory at the synaptic level. Emotional memory's tenacity is the familiar bane of therapists, and researchers have long believed that emotional memory forms indelible learning. Reconsolidation has overturned these views. It allows new learning to erase, not just suppress, the deep, unconscious, intensely problematic emotional learnings that form during childhood or in later tribulations and generate most of the symptoms that bring people to therapy. Readers will learn methods that precisely eliminate unwanted, ingrained emotional responses—whether moods, behaviors, or thought patterns—causing no loss of ordinary narrative memory, while restoring clients' well-being. Numerous case examples show the versatile use of this process in AEDP, Coherence Therapy, EFT, EMDR, and IPNB.

"Ecker's, Ticic's, and Hulley's Unlocking the Emotional Brain, like some earlier classics, draws from, adapts, and integrates the very best of the best currently available concepts and techniques into a powerful and accessible psychotherapeutic method. What sets this book apart is how these elements are mixed, matched, and delivered to each individual client. Packaged in a highly engaging read, psychotherapists of all sorts will find many resources which will enhance as well as ease their work."

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